# THE AMERICAN GAS LIGHT JOURNAL

PUBLISHED WEEKLY, AT NO. 42 PINE STREET.

VOLUME XCVIII., No. 13.
Whole No. 1,973.

NEW YORK, MONDAY, MARCH 31, 1913.

Subscription, $3 Per Year.
$4 Canada, $5 Foreign.


INDEX TO CONTENTS, PAGE 201. . . . . ADVERTISERS' INDEX, PAGE 24.

*Riter-Conley Manufacturing Company*

STEEL CONSTRUCTION

*Pittsburgh*

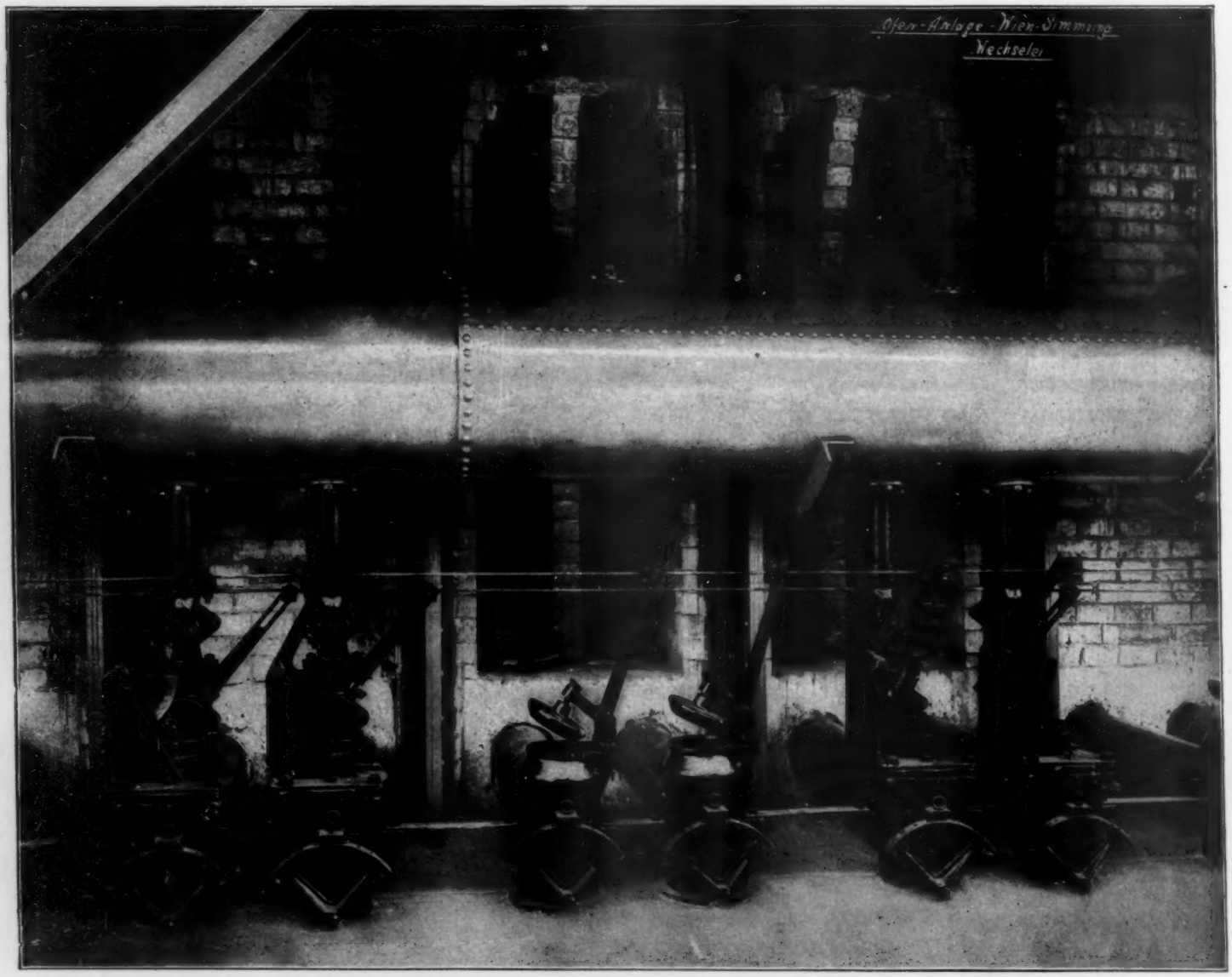
LIBRARY OF CONGRESS
MAR 31 1913
SMITHSONIAN DEPOSIT.

# REGENERATORS VS. RECUPERATORS.

We used to build Gas Ovens with recuperators, but the serious objections to this wasteful, inefficient method of recovering heat from the products of combustion soon led us to substitute regenerators.

If you want recuperators, we would refer you to others; but if you want to be counted among the leaders in the progress of carbonization of coal, let us demonstrate to you why we build regenerative ovens.

**See our Brochures Nos. 3 and 4.**




KOPPERS REGENERATORS—GAS PLANT AT VIENNA.

## H. KOPPERS COMPANY,

CONSTRUCTORS OF HORIZONTAL CROSS-REGENERATIVE COKE AND GAS OVENS,

**5 S. Wabash Avenue, - - - CHICAGO, ILLINOIS.**

THE AMERICAN
# GAS LIGHT JOURNAL

VOL. XCVIII., No. 13. NEW YORK, MARCH 31, 1913. WHOLE NO. 1,973

## CONTENTS.

An Asterisk (*) Denotes an Illustrated Article.

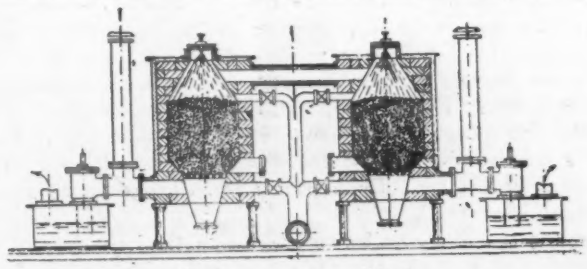
*Carbureting with Tar.—The Rincker-Wolter Water Gas Plant ..... 201
Proceedings, Fifth Annual Meeting, Indiana Gas Association—
[Official Report] ..... 202
First Day, Morning Session—The Report of the Executive Committee—Report of the Secretary-Treasurer—President's Address—Report of Committee on President's Address—A Fraternal Action—The Benefits of Gas to the Public, by Mr. A. S. Cooke—Discussion—Preservation Treatment of Wood with Water Gas Tar—Discussion.
OFFICIAL NOTICE—
Fifth Annual Meeting, Pennsylvania Gas Association. ..... 208
EDITORIALS—
A National Disaster ..... 208
Briefly Told ..... 208
Thermal Values of Gas and Electricity—New Economies in Coal—Going Concern Value—New York Section, "Gas Meeters"—April Meeting, New York Section, Illuminating Engineering Society—Hot Galvanizing Again—Three New Alloys—Occupational Diseases in Chemical Trades—Arc Lamp without a Globe—Exhaust Heat Boiler—Current Mention.
Publications ..... 209
SPECIAL ENGLISH CORRESPONDENCE ..... 211
Gas or By-Products?—New Light on Fresh Air and Ventilation.
NEW METHODS AND APPLIANCES ..... 212
A Test of Surface Combustion—Some Properties of Carbon Monoxide—Up-to-Date Methods in Gas Range Manufacture.
ITEMS OF INTEREST FROM VARIOUS LOCALITIES ..... 214
Must Treat City the Same as Other Consumers—New Franchise in Clinton—New Haven Stock Increase—Indianapolis Change in Control—Mr. John Williamson Recovering—Stockholders Suit Against Washington (D. C.) Gas Light Company—And Other Items.
The Market for Gas Securities ..... 216
Meeting Times of the Various Gas Associations ..... 216
Public Lighting Table for April, 1913 (Advertising Section) ..... 10

## Carbureting with Tar.—The Rincker-Wolter Water Gas Plant.

A novel form of water gas apparatus is that recently erected to meet the demands of gas consumers in the Dutch town of Koog aan de Zaan. The plant is so constructed that a carbureted water gas may be obtained without the necessity of employing a distinct vessel as a carbureter; that is to say, the gas as soon as it is produced is carbureted in the generators.

The system—known as the Rincker-Wolter—has been working for some years at the Utrecht gas works, and the plant seems to have proved itself an effective and economical adjunct to the coal gas apparatus. Its chief value and dissimilarity from other plants lie in the fact that any waste oil, however inferior, may be employed for carbureting purposes, and both coal gas and water gas tar may be used with good results.

As can be seen from the diagrammatic sketch the plant consists of two identical generators, and no other vessels are used for the production and enrichment of the gas. The generators are lined with fire bricks, and the fuel sprays pass through the center of the charging door lids. In order to thoroughly grasp the principle of the system, it is essential that the functions of the various connections on the generators should be understood. Near the top of each generator is a tube connecting the two shells, and by means of this the gas produced in one generator may pass to the other. In addition, both generators are fitted with primary and secondary air supplies from




Diagrammatic View of Rincker-Wolter Plant.

blast pipe. The primary air inlets are below the grate-bars, whereas the secondary air is admitted at the top of the fuel bed. There is a gas outlet to each generator below the grate bars which leads to a stack and a wash-box. Each generator has a bottom steam supply.

The whole of the operating is carried out from the working floor, which is level with the tops of the generators.

The apparatus is started in the same way as the ordinary water gas plant. When the fires in both generators are thoroughly started, and the coke is on a level with the secondary air inlets, the air-blast is admitted below the fuel in (say) the right-hand generator and above the fuel in the left-hand generator.

Before blowing is commenced, the stack valve on No. 1 generator is shut, and that on No. 2 generator is opened. In this way, the direct air-blast raises to a certain extent the temperature of the fuel bed in No. 1 generator, but, as combustion is incomplete, a stream of producer gas is passing through the top connection into No. 2 generator. This combustible gas then comes into contact with the secondary air and its consequent combustion provides sufficient heat for raising the temperature of the fuel in No. 2 generator. The hot gases pass downwards through the coke bed, and then through the open stack valve.

It is advisable to secure, as far as possible, equal temperatures in both generators, and in order to do this the sequence of generators is reversed after a period of about 2 minutes. Thus the primary blast is admitted to No. 2 generator, and the producer gas meets with the secondary air in the top of No. 1.

By heating the generators in this way for some time a temperature sufficiently high for gasmaking is obtained.

In the Rincker-Wolter plant the run usually lasts for about 6 minutes, but it is unique in that no steam is admitted to the generators during the first half of the period. The generators are always operated in series for blowing, but gasmaking is carried on in each one alternately. Assuming that a run has just commenced in No. 1 generator, the oil, or other carbureting agent is sprayed on to the coke in this generator.

On coming into contact with the incandescent coke, the oil is immediately gasified, and passes off through the bottom of the generator. At the expiration of about 3 minutes, the oil is shut off and steam is blown through the same spray—partly for cleaning purposes—for a period of about 75 seconds. The No. 1 wash-box valve is then closed, the corresponding valve on No. 2 being opened. Steam is then admitted to the bottom of No. 1 generator for 1 minute, and the gas produced passes through the connecting pipe and second fuel bed to No. 2 wash box. The steam is now shut off, and air admitted for a few seconds, to scour the apparatus.

From the above description, it may appear that a somewhat complicated series of operations are comprised in the run. It will easily be grasped, however, by tabulating the working as follows:

| | |
|---|---|
| Oil sprayed in (say) No. 1 generator | 3 minutes. |
| Steam blown through spray | 75 seconds. |
| No. 1 wash-box valve closed and No. 2 | opened. |
| Steam admitted under No. 1 | 1 minute. |
| Air admitted to No. 1 | about 10 seconds. |
| Total period of run | about 6 minutes. |

After the completion of the above run, the blowing commences, and continues for about 2 minutes. The run is then resumed, but with the difference that the first generator in the preceding cycle now becomes second. This alternate operation of the generators causes practically similar working conditions for both as regards temperature and consumption of coke and oil.

The temperature in the generators plays a prominent part in determining composition of the gas, and by varying them within certain limits it is possible to regulate the constituents present in the finished product. A low temperature causes the formation of heavy hydrocarbons; as the temperature rises the amount of methane increases at the cost of the illuminants; and at still greater temperatures the amount of hydrogen rapidly increases. Gas oils, residue oils and tars, require different temperature for efficient gasification; and a considerably higher temperature has to be employed when a gas containing a high percentage of hydrogen is desired. This, of course, is not necessary for ordinary gas, but the Rincker plant is used to some extent for balloon gasmaking, when a high percentage of hydrogen is essential.

As soon as the oil comes into contact with the incandescent coke, it is decomposed, and a mixture of permanent gases results. The decomposition, however, causes the formation of large quantities of free carbon, which is deposited on the coke in the generators. This lampblack is partly consumed during the steaming and blowing periods of the run; but by far the greater portion is burned during the next "blow." Such liquids as coal gas and water gas tar form large amounts of carbon, and, in this way, have proved a little unsatisfactory. When liquids of a highly viscous nature are used, they are previously passed through an oil heater, and mixtures—such as tar and oil—are treated in a mixing apparatus fitted with a mechanical stirring arrangement, which ensures homogeneous material being supplied to the spray. Owing to the trouble with tars, it is advisable to mix tar and oil together—usually one part of the former to two of the latter.

A decided advantage in favor of this plant is that it is only necessary to clinker the generators once in every 24 hours.

The water gas made at Koog aan de Zaan is of high quality. The following is the average composition:

| | Per Cent. |
|---|---|
| Hydrogen | 44.5 |
| Methane | 15.6 |
| Hydrocarbons (unsaturated) | 7.7 |
| Carbonic oxide | 19.6 |
| Carbonic acid | 3.7 |
| Oxygen | 0.7 |
| Nitrogen | 8.2 |
| Heating value | 552 B.T.U. |
| Specific gravity | 0.513 |

The consumption of coke and oil depends, of course, on the quality of the former and the type of the latter. For ordinary residue oil the consumption for a gas of the above quality is about 47 gallons of oil per 1,000 cubic feet, and the coke used amounts to only about 11½ pounds. The average cost of the gas is about 39 cents per 1,000 cubic feet.

[Official Report.]

## FIFTH ANNUAL MEETING, INDIANA GAS ASSOCIATION.

Held in the Claypool Hotel, Indianapolis, Ind., March 12-13, 1913,

### First Day—Morning Session.

The President—It gives me a great deal of pleasure to call to order the fifth annual meeting of the Indiana Gas Association on the first new date of our meeting. The sun is shining and we ought all to be very happy that we changed the date. I regret very much to say that the Governor will not be able to deliver his address of welcome. Late yesterday afternoon he promised to be here, but this morning with extra work coming on him on account of the closing of the Legislature he finds it to be impossible. We may be able to have him later in the session, which we are going to endeavor to do. So we shall proceed to our regular order of business.

The roll call and the reading of the minutes were dispensed with.

### The Report of the Executive Committee

was read by the Secretary, as follows:

March 12th, 1913.

Since the last Annual Meeting of the Association the Executive Committee has held four Meetings in Indianapolis, namely: May 21st and October 23rd, 1912, and February 19th and March 11th, 1913. Prior to the first of these Board Meetings, President H. L. Olds instructed the Secretary to address a letter to all members of the Association inviting suggestions, and an expression of opinion, as to what topic or line of Association work be taken up at this annual meeting. The suggestions received resulted in the decision of the Committee to have an exhibit of industrial gas appliances, to which the members would go in a body for an afternoon's industrial appliance demonstration. Carl H. Graf, Vice-President of The Indianapolis Gas Company, a member of the Executive Committee, offered the Company's display room and industrial equipment for the purpose of the exhibit. It is, therefore, intended and hoped that all the members present at the annual meeting will view the exhibit. A Committee, comprising Messrs. S. E. Mulholland, A. S. Cooke. and P. Eves, was appointed to arrange for this exhibit and a representative assortment of appliances is now "at your service."

A suggestion from Jas. W. Dunbar brought a resolution to secure statistics relating to the operation of gas companies in the State of Indiana. These statistics, which are very encouraging, have been secured through the Bureau of Information and are now on file in the Secretary's office.

The Bureau of Information has been energetically conducted by the appointed Chairman of the Bureau, Mr. O. O. Thwing, since its formation at the last meeting. While it was hoped that more of the members of the Association would avail themselves of the services of the Bureau, the questions and replies form a contribution of valuable information for consideration and discussion at this meeting.

The Executive Committee desires to express the hope that those gas companies in the State of Indiana which are not represented in the Association will consider it their bounden duty to see that one or more of their officials join the Association.

Signed by the Committee.

The President—What is your pleasure regarding the report of the Executive Committee?

On motion of Mr. J. W. Dunbar, the report of the Executive Committee was accepted and approved.

The President—We will now have the

### Report of the Secretary-Treasurer.

As Secretary, Mr. Eves reported a total membership of 161. During the year 11 active and 14 associate members have been admitted; 11 either resigned or were dropped, and one death, leaving a total membership to date of 149. As Treasurer he reported a receipt of $924.50, an expenditure of $957.12, and a balance of $98.08. The reports bore the attestation of the Auditing Committee.

On motion the reports were ordered received and filed.

The Vice President assumed the Chair and the President delivered the following

### INAUGURAL ADDRESS.

Mr. Chairman and Members of the Indiana Gas Association: With the general practice that seems to be thoroughly established, a few minutes is allotted upon the programme for what is given the title of the President's Address. Just who was the originator of the thought that a president's address is necessary at the annual meeting of the Association does not seem to be recorded, so I assume that it must be a part of the ordeal that your retiring President and this Association have to pass through.

The fifth annual meeting of this Association is now fairly started, and it finds us meeting for the first time on a new date. It is to be hoped that the change in the date of the meeting will meet with the approval of a very large majority of the members, and be the means of making it more convenient for their attendance.

As we look back over the past few years of this Association, it is with a great deal of pleasure that we note the splendid growth in the membership that the Association is receiving and the high order of the technical papers, all of which have been important factors in the development of the gas business in this State.

Permit me to call your attention to the object of this Association, so ably set forth in the Constitution:

"The object of this Association shall be the promotion and advancement of knowledge, scientific and practical, in all matters relating to the construction and management of gas works, and the manufacture, distribution and consumption of gas.

"The establishment and maintenance of a spirit of fraternity between the members of the Association, by social intercourse and by friendly exchange of information and ideas on the before-mentioned subject-matters.

"The inducement and extension of cordial and friendly relations between the manufacturers of gas and their patrons, based upon mutuality of interests."

This thought ought to be inducement enough for everyone engaged in the gas business to want to become a member of the Association.

During the past year a Bureau of Information has been in active service and its report you will find of special interest. The Association has been extremely fortunate in having such an able Chairman at the head of the Bureau, and I hope that he will be retained and that the members will give him all the assistance within their power, as it is one of the most valuable departments of our Association. During the past year an effort was made to gather reliable statistics on the operation, distribution and management of gas companies in this State. This effort has met with some success, but not what your executive board hoped. The statistics would be extremely valuable to you and the Association, and I would recommend that a continued effort be made to have every company make as complete a report as possible.

Each year records an increase in the number of artificial gas companies in this State, as natural gas fails in the communities now supplied. These natural gas communities are all educated in the use of gas, so very little effort is necessary to develop the business in such territory.

Within a few years gas stoves and water heaters will be the standard equipment for every home, and the coal stoves only sold or used where gas is not available.

Many of us remember the statement that was made some years ago by some of the very progressive gas companies, that 66⅔ per cent. of their total business represented fuel business. At that time this was considered a most remarkable statement; now many of the companies can state that 90 to 95 per cent. of their total business is fuel business.

We do not want to lose sight of the illuminating end of the gas business, for it is a very important part of our business, and one that can stand a very large increase. The present development along the lines of incandescent gas burners and gas arc lamps makes it most desirable for general illumination.

The general illumination of streets by cluster arc lamps is only in its infancy. There is no reason why this part of the business should not be developed on a much more extensive scale. I suppose that if the gas companies years ago would have placed upon the streets, gas posts as close as our electric friends are now placing cluster lights, there would have been an awful noise made about the expense of lighting bills; so we owe our electric friends some gratitude for developing the desire for increasing street illumination.

*Industrial Gas.*—The industrial gas business should be developed in every way possible. This business is not only desirable, as the service is rendered largely at the time when it is off our peak load, but it also means the development of the sale of a very large volume of gas.

We are extremely fortunate in being able to attend the exhibition of industrial gas appliances that has been arranged for this meeting by the good services of the Indianapolis Gas Company. It is a very opportune time for this exhibition and I think the time that we spend there will be very helpful in the development of the industrial business in our territory.

The continued increase in the price of fuel, and the difficulty of securing it at any price, place us in the position of being able to secure a large volume of this industrial business from those who have been using oil furnaces.

Another year a paper should be read before the Association on the comparative cost of fuel oil furnaces and gas.

The Association should be congratulated on having given to the gas world such a valuable paper on the "Relation of Heating Value and Candle Power," as was prepared by Mr. James W. Dunbar and Mr. A. B. Davis. The United States Bureau of Standards, Circular No. 32, upon "State and Municipal Requirements," and "Quality and Testing of Gas," contains much data of interest upon this subject.

At the last meeting of the American Gas Institute the heating value of gas was one of the principal subjects discussed, and it seems that every effort is now being made to acquaint the consumers with the real standard that should be used in determining the quality of artificial gas.

It is to be hoped that the candle power requirements will soon be dropped in all franchises that now have them stated.

It is my belief that the net heating value of artificial gas is the one standard that should be used and not confuse the public with the terms of net and gross heating value.

The State of Indiana is extremely fortunate in having two very splendid technical schools, and I believe that we should do everything possible to encourage the development and research work of artificial gas in these schools. I would recommend strongly that this matter be brought to the attention of the faculty of these schools and endeavor to co-operate with them in this work. I fully appreciate that we are fortunate in having one other Gas Association carrying on experimental work at a State University, and while it is perhaps, not necessary for us to follow such a course, yet there are many other questions that could be considered by these schools that would at least encourage scholars in attendance to take more interest in the gas business.

*Coke.*—The experiments that have been made as to the relative value of gas house coke and anthracite coal show conclusively that coke is on a comparative basis and should be sold on a comparative price. The government tests show that the total units in a ton of coke are about the same as in a ton of anthracite coal. Every effort should be made to encourage the manufacturers of furnaces and hard coal stoves to build their apparatus with some consideration for the use of coke for fuel. At the present time coke is being successfully consumed in stoves and furnaces that were built with very little consideration for the use of coke.

The State University of Illinois has made some developments along the lines of coking the Illinois coal at low temperature. One of the principal industries in this State, is the mining of coal, and if there are any new developments along the lines of coking this low grade bituminous coal, this Association should encourage it. I recommend that at the next annual meeting of this Association a paper be given showing the development of coking low grade bituminous coal.

The rapid increase in the cost of oil and other raw materials entering into the manufacture of water gas has compelled many to turn to the manufacture of coal gas. At the present time the outlook is not very encouraging for any great reduction in price of raw material in the manufacture of water gas.

This State is rapidly taking up the centralization of gas plants and the distribution of gas to a number of towns from one central plant under high pressure. We now have three or four plants that are distributing gas at what was looked upon a few years ago as an extremely long distance, but now is considered an everyday practice. It is also noticeable to see the drop in the initial pressure that is being maintained for these distribution lines. We can all expect to see more progress along these lines within 2 or 3 years, and I predict that Indiana is going to show some very large developments along high pressure distribution. In using the term high pressure, I assume that anything above 5 pounds will be termed high pressure, and from all accounts it looks now that gas will be distributed 40 or 50 miles with only an initial pressure of 10 pounds to 15 pounds.

*Public Utility Commission.*—This State has finally passed a law creating a Public Utility Commission. This law becomes effective May 1st, 1913. Those of you who are not entirely familiar with every department of your company should immediately commence to inform yourselves, and have your affairs in such shape that you can be helpful to the Commission when the time arrives for operating under the present Commission law and the rules and regulations that will likely be required by the Commission. I would suggest that if you have not a complete inventory of your property, that you have one prepared at a very early date, as this no doubt will be one of the first requirements.

It is always with regret that we have to mention the passing away of one of our members. During the past year death has taken from our ranks Mr. G. G. Atkinson, Manager of the Goshen (Ind.) Gas Company.

In closing, I wish to take this opportunity of expressing my thanks and appreciation to the members of this Association, the Executive Board and our efficient Secretary for the help that has been given

me in carrying on the work of this Association during the past year.

Now, gentlemen, you should co-operate with the Commission. You want to know what length of main you have, how many feet of main are laid under the pavement, and under what kinds of pavement, whether of concrete base or otherwise. You are going to have to furnish this information to the Commission, and if you get yourselves into shape now, I think you will be looked upon with a good deal more favor than if you do not.

On motion the address was referred to a Committee for considera. tion and report, and the Vice-President appointed as such Committee, Messrs. Loomis, Johnson and Cooke.

The President resumed the chair and said: Before starting on our regular programme, I would request every member wishing to discuss a paper to announce his name before starting, so that the stenographer will have it properly. Another matter I wish to bring to your atten tion quite positively. Dinner will be served in the hotel this evening at 6:30. It is very important that we know how many are going to be present at it prior to the noon adjournment. I will now name a Committee on Nominations, Its members are: Messrs. F. M. Loomis, W. I. Battin, T. A. Elder, Jr., John H. Dykeman and John Dick.

### A Fraternal Action.

Mr. O. O. Thwing—Mr. President and gentlemen: A year ago when we elected our officers, we had the pleasure of electing Mr' William Wallace, Vice-President of this Association. At that time he definitely announced that he would not become a candidate for President of the Association under any conditions. Mr. Wallace has just completed a term of 45 years in the gas business with one company. He was one of the original charter members of the Western Gas Association. He has had a long, interesting and honored experience in the gas business in Indiana, and it is my pleasure, representing the Executive Committee, to propose him for Honorary Membership. I believe that the Association will be honored by this action

The President—The Executive Committee certainly ought to feel proud in nominating Mr. Wallace for honorary membership. It gives me a great deal of pleasure—it may not be in order for me to second Mr. Thwing's motion—I wish I might say all the good things it is possible to say about Mr. Wallace.

Gentlemen, you have heard the report of the Executive Committee Are there any further remarks? If not, I would suggest that a risin vote be given to Mr. Wallace for honorary membership in this Association.

The motion, having been seconded, was unanimously carried by a rising vote.

Mr. Wallace rose and acknowledged the honor in a few brief words.

The President, having announced that the paper list was in order, introduced Mr. A. S. Cooke, of Terre Haute, who read the following paper on

## THE BENEFITS OF GAS TO THE PUBLIC.

The definition of the word "benefit" is in part as follows: "An act of kindness. Whatever promotes the happiness and well being of a person or thing or adds to the value of the property."

From the above, little thought is required to deduce the fact that generalities only can be indulged in at this time, for volumes would be needed to do it justice.

When we give a thought to the environments under which we live to-day, and compare them with conditions of the past (of not very remote period) the material aid afforded by gas towards the beneficial change looms up large, and of so substantial a character as to suggest the probability of eventually becoming universal in every commun ity where available, for surely in the minds of all who would progress "Happiness and Well Being" and "Addition to Property Value" should outweigh "Force of Habit" and "Adherence to Antiquity."

It is undoubtedly true that in many instances benefits are realized, but not fully appreciated, due to the fact that extent of kindness nor promotion of happiness conferred is not known.

It also is true that gradual change in methods and conditions prevent sharp contrasts which are needed to emphasize benefits, for only by comparison can benefits be measured.

In no other fields are the benefits of gas more forcefully demonstrated than in the homes of the country, where emancipation from worry, labor and drudgery comes with the introduction of gas for fuel, and a full realization of the benefits is only appreciated by those who have had personal experience with methods more crude, for those born in the age of benefits take them as an accepted fact, having no knowledge of any "act of kindness" nor "promotion of happiness" extended by the purveyors of gas.

The particular benefits of gas may be defined as follows, applying with equal force to the various fields of use:

1. Cleanliness Reduction of labor;
2. Quickness... Saving of time;
3. Economy ....Utilization of heat energy produced;
4. Control .....Production of perfect results and unlimited range of usefulness;
5. Supply.....Elimination of all thought in reference to quantity.

The foregoing sub-divisions are susceptible to further definition, but it is unnecessary at this time to go into them.

If it were possible to prepare a sketch of an inverted shaft or monument, showing true relations of various heat producing methods of the home, from the day of the open camp fire to the present day, what a weird looking picture it would be.

First, the apex resting on the ground would represent the camp fire, and thence upward and outward would be added blocks representing newer methods with improvements properly represented by increased size of section, until it reached that block or section representing the modern gas range, which by right of superiority would so far overshadow the others that they should be considered as an element of comparison, and thus, in a very pronounced manner, would be set forth the extent and value of the benefits of gas.

The various stages of utilization of solid or liquid fuels represented in the monument of progress, up to the day of the gas range, would of necessity reflect the advanced refinement of the operator. In fact it is true that refinement of the operator increased at a greater ratio than improvement in methods, hence the consummate ease with which criticism is fired at the modern appliance of the present day; it is a question with many as to "not what it is" with reference to precedents, but "what it should be" in accord with degree of refinement.

Admitting the foregoing to be true the "benefit value" of gas as a domestic agent would be more nearly approximated by a lady of the "stone age period" could her verdict be obtained than one of the present day, and this opinion is given with all due respect to the latter, and a full appreciation of her higher intelligence and refinement, but seeming lack of appreciation of the "higher benefits."

Independence is one great benefit of gas to the housewife. She is independent of the coal man, wood man, ash man, and if necessary the hired girl. Independent of whether conditions which have no effect on the gas range. The elimination of coal, wood and ashes brings relief from all the dust and dirt attendant on their receipt and use.

The gas company is the only one she need depend upon to keep her various appliances in efficient condition to dispense benefits previously mentioned.

Gas is an illuminant for the home must not be overlooked, for it without question is the leader of all artificial mediums. With quality approaching that of sunlight; with a steadiness that exceeds the natural, it is a beneficial illuminant that permits of continued work or study without injury or fatigue to the eye. Modern methods of control permit of use under practically every condition without inconvenience, and it is suggested that perhaps the extended use of gas as an illuminant is retarded through lack of knowledge of this fact due to want of proper publicity and demonstration.

In closing this branch of the subject a hope is expressed that the near future will bring a material change in the construction of all buildings, whereby provision will be made to permit of gas ranges to be placed in a recess so that front will be flush with kitchen wall, and that proper ducts will be so placed throughout the entire building that gas will be in demand not only on account of the superior illuminating value, but also because of its worth as a ventilating agent, a benefit little understood and greatly undervalued at this time.

In the commercial and industrial fields, so varied and important are the benefits of gas, that to enumerate them would be practically impossible.

Economy of space is a benefit that must appeal to every interest having to do with heat for whatever purpose. Think what it means to hotels and restaurants to put to more valuable use the space necessary for solid fuel, to dispense with the cost for labor needed to handle such fuel, ashes and dust created. Think what it means to

the manufacturer who by the substitution of suitable gas appliances puts away the cumbersome, costly, inefficient apparatus which demands constant attention, piling up labor costs. Think what it means to many small industrial interests whose existence and success are dependent on gas as a heat and power source. In many instances gas has brought about a revolution in methods of manufacture resulting in better product and reduced cost of production, and in some cases has made possible results never before obtainable.

Economy of operation, through maximum utilization of heat energy, produced a benefit that should be most persistently advocated, for without doubt it is one of the greatest. Uniformity of quality; complete control under any and every condition; continuity of supply at constant pressure, these features are especial benefits applying to commercial and industrial work, as through the medium of proper appliance every requirement can be successfully met. With such possibilities available who shall measure the benefits of gas to the public? No doubt the full value of gas is not yet realized. Many uses to which it may apply are as yet unknown, but the ever busy mind of the scientist and the inventor may be depended upon to from time to time open new avenues of use by which additional benefits will be conferred upon mankind.

To the men who have brought forth the various appliances which make possible the beneficial use of gas, too much credit can not be given, for through them the scope of usefulness has broadened to its present dimensions and to them must we look for greater growth.

In that it is practically impossible to specify the benefits of gas referring to direct application, how similar would be the proposition when considering the indirect benefits that accrue to the miners of coal and drillers for oil that enter into the manufacture of gas; of the men who dig the ore from which iron and steel are made that is used in the construction of different types of appliance; the pattern makers, moulders, iron workers, brass workers; the railroads and boats that transport both raw material and finished products; the dealers, salesmen and the immense army of people who are necessary to successfully carry on the many interests involved. When we think of all the indirect benefits to the public, and the vast forces in constant operation to supply gas benefits to the user, are we not inclined to entertain a doubt of our own full realization of the direct benefits.

Should we not resolve to put forth every effort to make known the benefits of gas and also have them appreciated.

*Discussion.*

The President—I ask for a full discussion of this paper. It is on a very interesting subject, one that we never can hear enough about. I will ask Mr. Eves to start it.

The Secretary—Mr. Cooke, in this valuable paper has these words, which are very important at the present time: "Think what gas means to the manufacturer, who, by the substitution of suitable gas appliances, puts away the cumbersome, costly and inefficient apparatus which demands constant attention, piling up labor costs." Our President in his opening address also makes timely reference to the continued increase in the price of fuel oil and the diffiulty of securing it at any price. Now, this raising of the price of oil and the extreme difficulty of getting any supply seem to emphasize more than ever before the benefit to the gas consumer of the constant availability of gas. This availability is of the greatest value and importnace to the industries. The use of gas for fuel in every kind of business is now becoming almost universal. One of the highest authorities on the use of industrial gas appliances says: "A long experience of 20 years has brought me in contact with about every line of manufacture known in the industrial world, and I have failed to know of one where gas cannot be used not only satisfactorily, but along economical lines and produce better results than where other fuels are used." This growing necessity for gas in the industries has induced The Indianapolis Gas Company to establish, as a pormanent display, the comprehensive exhibit of industrial gas appliances which has been made one of the educational features of this convention. I believe the gas company that does not fully recognize this most important public benefit will not only be losing its share of business from the use of industrial appliances of all kinds, but will not be giving that good service which the company's patrons would most appreciate. Mr. Cooke, the author of this paper, will be able to tell you of a representative exhibit of industrial gas appliances that his Company, in Terre Haute, and many other gas companies, have been able to have as an offer from the Improved Appliance Company of Brooklyn, N. Y., an exhibit that is available, I believe, to any gas company at no cost to the company for the exhibit and at very little expense for the publicity that should be given the exhibit in the local newspapers, and by means of the personal invitations that would be sent out to the industries. Many of the smaller gas companies have experienced a real difficulty in dealing with this industrial problem, but here, I think, is one of the opportunities now available to the companies and one that would make more widely known in the various communities the "industrial" benefits arising from the use of gas. I would suggest that Mr. Cooke supplement his paper with a little information regarding this exhibition which is offered to gas companies. Some time ago he favored the Indianapolis Gas Company with some specimens of the advertisements which were used in Terre Haute, and I have taken the opportunity to bring these here in order to show you the comprehensive kind of an exhibit which is made by this Company, an exhibit, as I explained, that is available to gas companies. I am sure that Mr. Cooke's experience, if he will give it at the close of the discussion, will be valuable to all of us.

The President—Mr. Shinnick?

Mr. G. S. Shinnick—In listening to Mr. Cooke's paper I was impressed with the fact that it would be difficult to discuss it, for it covers the ground completely. I had in mind one great benefit to the public in the domestic happiness that originates principally from the kitchen equipped with modern improvements and appliances, and so on; for the kitchen is the originating point of a man's household domestic happiness. If the kitchen is right, the home is right, wherefore the thought occurs, what a big benefit to the public gas is by originating happiness in the home. It sifts out to the public in general, and from neighborhood to neighborhood, then finally grasps the entire community. The kitchen, as most men know, is a most important part of the household, and anything that relieves the wife of various duties, and makes for independence, is very valuable. Such is the only thought that occurred to me in the paper that I would care to offer in this discussion. The other parts are very well covered. But it struck me that the development of domestic happiness from the kitchen, then on through the house to the neighbors and finally to the entire public as a grand public benefit, was a very valuable thing, and that this was brought about by gas improvements and stoves, and so on.

Mr. Graf—As Mr. Cooke says, at the very start of his paper, the subject is so large you can only treat with generalities. One thing, however, not brought out, is what the matter of uniform and constant price means to those who use our gas. A few cases on record note where the price of gas has gone up; but these are so few that they are negligible. The general tendency of the price of gas is downward. It certainly means a great deal to the household consumer to know that the price for this commodity is practically fixed, and, if anything, he has the assurance of a lower price in the future. This applies particularly to the use of gas for industrial purposes. The tendency in that direction is decidedly downward. We are enabled to make the low price because it gives us the load that we want. We can afford to sell gas for industrial purposes at a lower price because our overhead charges go on right along. We get a better capacity out of our mains. Another thing. It is of great benefit to the householder to do away with the annoyance of stacking his coal when the prices are low and attractive. Above all, I believe there is hardly a community at the present time where the price of gas is not at the point that will show economy over any kind of solid fuel that can be used for domestic purposes. As I look at it, we have gone beyond the point where gas is considered a convenience or a luxury. I should say at the present day gas is a necessity. I think that is amply illustrated by the fact that in our community here it is almost impossible to sell or even rent a home unless it is piped for gas. [Applause.]

The President—I want a full discussion of this paper, and I shall call on you if you don't get up quickly. One here in the audience, not known to a great many of you, lives in a part of the country right in the heart of the coal district. I know he can tell us something about the comparative cost of gas and coal. I will call on Mr. Powers.

Mr. W. L. Powers—Mr. President, I did not come prepared to make any proper discussion of this subject. In fact, I have not seen the paper. A point that occurs to me in reference to the benefits of gas, in the line of economy in the use of gas, is the saving in the cost of decorations and repairs to a home, not only in the use of the gas range, but in the use of gas for house heating, which is being tried to some extent through Illinois and Missouri. Speaking of the industrial appliances, I would like to call your attention to an illus-

tration made at the Decatur (Ills.) High School, where there is a complete equipment in the manual training department for the heating of steel by gas. In looking around for an opportunity to educate the manufacturing people in the use of gas, we hit upon that opportunity of getting the matter before the public, through the boys who are taking the manual training course. We have just completed an installation there of gas appliances for the heat treatment of steel which will be of benefit not only to us there but to the gas companies in general. The minimum price of gas throughout the plants operating in Illinois is $1 per 1,000 cubic feet Coal is being delivered at our doors or in our bins for $2.25 to $2.50 a ton, and although we have not set the world afire in industrial lines, we are doing a large business there along such lines.

The President—Mr. Travers?

Mr. P. T. Travers—I have given only a little thought to Mr. Cooke's excellent paper, but he has covered the ground very thoroughly. Just one thought occurs to me. He says, "First, the apex resting on the ground would represent the camp fire, and thence upward and outward would be added blocks representing newer methods with improvements properly represented by increased size of section, until it reached that block or section representing the modern gas range, which, by right of superiority, would so far overshadow the other that they could be considered as an element of comparison, and thus in a very pronounced manner would be set forth the extent and value of the benefits of gas." I believe right alongside of that gas range should rest the instantaneous automatic water heater, for the reason that, at the present day, with the automatic water heater brought to the point where it is, if installed in the house of the consumer it gives him a greater efficiency in the application of heat travelling to the water than in any other gas water heater of the tank type that is made, with a lower cost of operation, saying nothing about the comfort derived from its use. While the initial cost is greater than with the smaller type of tank heater, in the long run the use of the instantaneous heater in the homes of your patrons will be appreciated more and more. I think it is the duty of the Indiana gas companies to get the instantaneous automatic water heater before their consumers, explaining to them the benefits derived from its use and its cost of operation as compared with other types of heaters, and the advantage to be derived from such use.

The President—There is one present who can give us valuable points on this subject, Mr. Kelsey, of Chicago.

Mr. F. P. Kelsey—I have not been thinking specifically about any particular development in our practical activities, but certain things do come to us as a sort of clearing house. One that appeals to me as particularly significant just now is the concentration on the house heating proposition. In Milwaukee our General Manager last year carried on exhaustive tests in house heating, as then existing. Of course, some very important developments have been made in the last year. Originally the development seemed to have been to the point where gas for house heating purposes in our climate (which is very cold) was on the basis of about 2½ to 1, as compared to coal, but I think the appliances developed last year will cut that down considerably. In better climates (for instance, in St. Louis) they have been more successful. I presume in that more moderate climate better results can be obtained than farther north, and I daresay, with the constant decrease in the price of gas, much house heating will be taken on that we do not dream of now. Within the last few weeks, when in Detroit the other day, I was told of an arrangement that was being put out on motors, replacing the carbureter, which makes it possible to test out these motors with city gas instead of gasoline or kindred volatile substance. It is really important the quantity of consumption they are taking on by this little appliance. It is hard for me to refrain, when opportunity offers, from calling the attention of gas men to the things that are being overlooked in the way of bringing to the attention of the housewife the means we have for lessening the work and increasing the efficiency of the domestic department of the home. It strikes me gas company advertising is yet really in its infancy. I think this is germane to the subject, as it brings home to the persons we reach the benefits we have for them. It strikes me the fundamental weakness in your advertising is that the company proceeds on the basis of placating the newspaper. Being based on that, naturally one of the first things they have done is to tell the dear people how fond they are of them and how much they are trying to do to give them service. Although this is absolutely true, it strikes me as not being the best way of getting at the proposition. Isn't it the most "worth while way" to tell them specifically and definitely just exactly what we are able to do for them? For instance, if we have a maintenance service for the arc light—I daresay there is not a gas company that featured this maintenance service as well as it might in a public way. The people are not really acquainted with our facilities for giving them service as much as they ought to be; but the most definite way of bringing this situation before the community strikes me as the best way. I do not think the Indiana Gas Association could spend its money better than by getting together as a State organization. As a member of the Advertising Committee of the National Commercial Gas Association I was very much interested in the plans we have been carrying out for a proposed national campaign. That campaign has been sat upon, but it is very much my hope that a national movement will be begun very soon. I understand that the electric men—of course, a great number of you men are members of combination enterprises—the National Electric Light Association is preparing to establish a national campaign. If the gas men do not follow suit they will lose out at a time when it is very essential that they should keep together on the proposition. I may have wandered from my subject, but it strikes me as a thing the Indiana Gas Association could very well concentrate on, during their meeting, with profit and enjoyment.

The President—May we hear from Mr. Kellum?

Mr. B. J. Kellum—I don't think I have anything to add to what has been said with reference to Mr. Cooke's paper. Comparisons are always more or less invidious, but while we are dwelling on ranges and automatic water heaters, we do not want to overlook the very fair percentage of the working hours when it would not be possible to derive any benefit from either one, unless we had light to see what we were doing. (Applause.)

Mr. Dunbar—Mr. Cooke is to be complimented upon having prepared for us this paper. The benefits of gas to the public cannot be too greatly impressed upon their minds. The benefits of gas are estimable things for all the people; but, unfortunately, they are not realized to the fullest extent. I have been very much pleased and instructed by the discussion over this paper this morning, and believe, as has been expressed by some one of the other speakers, that we are entering upon a new era; that there are to be new developments and new uses for gas that will absorb our product in undreamed of quantities. I believe that, while we have spent a great deal of time in the advertising of gas for illuminating and cooking purposes, and later on for the heating of water, and that while this field is a legitimate one, and one perhaps that has been to some extent neglected, yet the great possibilities of gas for industrial purposes are those which will shortly require our attention, perhaps to an extent of profit in our business that has hardly been dreamed of, let alone realized, heretofore. I was very much pleased with our President's address, in which he suggests that a paper be prepared for our next meeting, comparing industrial gas with the oil gas appliances that have heretofore been used, and which now are becoming impossible from an economical point of operation, with the hope in view that gas will supplant and take care of that part of the business. I am enthusiastic as to the possibilities of gas development, and am sure that all who have listened to the talks of the members who have preceded me are of the same opinion. One paragraph in Mr. Cooke's paper I wish he would explain. He says: "The benefit value of gas as a domestic agent would be more nearly approximated by a lady of the 'stone-age,' could her verdict be obtained, than one of the present day, and this opinion is given with all due respect to the latter, and a full appreciation of her higher intelligence and refinement, but seeming lack of appreciation of the 'higher benefits.'" I wish some one would inform us what stage of the evolution of our planetary system the stone-age was supposed to exist. I would like to have him explain to us the condition of society in that time, what sort of an intelligent, refined, ethereal and aesthetic sort of a lady there must have been whose judgment would be to-day more in accord with the benefits to be derived from the use of gas than those who have experienced its practical benefits. I feel that while he has paid tribute to the intelligence of the ladies to-day, yet I am one of those who would like a little light on the ladies of whom he speaks. (Applause.)

The President—Before calling on Mr. Cooke to close the discussion, we would be glad to hear from Mr. Cunningham.

Mr. J. R. Cunningham—I do not know that I can add very much to what has been said on the benefits of gas to the public, but these are so many and varied I presume we could discuss almost indefinitely on the subject. One thought I had in reading this paper, and in listening to the discussion, one which is necessarily close to me, is the question of divorce. Up to a few years ago gas as a domestic fuel

was very rare; and surely the teaching thereof was very rare in our public schools, or in any school. Where gas is obtainable every up-to-date school board now has installed such a department. I believe this is principally due to the efforts of the gas companies, whose ideas, of course, are commercial. But I also believe we are laying the foundation perhaps for the solution of abating, or helping to abate, one of the greatest evils of our country to-day, the evil of divorce. I am not going to preach you a sermon, but you will wonder what the connection is between gas and divorce. I will explain. Heretofore, when one of our girls graduated, her knowledge of domestic science was almost nil save what she obtained from her mother; but now, I look to the time when our girls on graduating will have a good, fair knowledge of domestic science, and when they leave to accept a position, or which the most of them generally do—to sally out to get a husband—after they get him the honeymoon is over and they start in to keep house. Usually there is a gas range there. Everything goes along swimmingly for perhaps a year or two, but when the husband finds out she really cannot cook a palatable meal, and it keeps going from bad to worse, finally they quarrel. Then she goes to the divorce court and gets what she calls a bill of divorce, and the husband is really the injured party; that is a fact. Don't think I am knocking the girls. I am not. I have got 4 of my own who are dandies. My wife is one of the best cooks in the State of Ohio. [Applause.] I think gas will save, not only improve, the relations of the family, but will improve society, and it will often save the taxpayer a great deal of money, for instead of that picture which I have drawn, contrast it with this. One of those girls is a good cook, as the gentleman expressed it a little while ago, and is not ashamed to go into the kitchen and cook a meal. She takes it as a pleasure, and if she does that the rest of her house is tidy and she is a good housekeeper otherwise. When the husband comes home, if he has a good, palatable meal, he compliments his wife, the nice little smiles cross the table to each other. If they happen to have children, and they ought to have them, the children are happy in the comfort and happiness of their parents. So, instead of having a divorce in that family, and children put away into the charitable institutions, no matter what those charitable institutions are, the taxpayer has got to pay the bill eventually. Therefore, when the state of society is improved the taxpayer is saved, the children do not come up before the Juvenile Court, and they do not become delinquent. That is one of the greatest benefits which gas has bestowed on the public. In concluding I want to thank Mr. Cooke for the generous notice he has given the manufacturers of gas appliances, and our corporation, in all this good work.

Mr. Cooke—Mr. President, this discussion has brought out the live benefits which must appeal to anyone who gives the subject a thought. I will try to take up some of the most pointed remarks as they occurred. Mr. Shinnick draws a very nice picture as to the model kitchen and the benefits accruing from such a kitchen. That occurred to me, still I thought possibly we had better not have things too nice in such respect, when I considered the added opportunities for auction bridge, etc. In Mr. Graf's remarks he called attention to economy. That is a good point to treat upon, but I believe the gas fraternity at large should give more thought to the matter of service. People want this. It is not always a question of dollars and cents to them, and I believe in many cases we make a mistake in bringing up the question of economy. We should get a person's mind off service and on dollars and cents, the part which should be considered last. Impress them with the value of the service and the other factor will take care of itself. Mr. Kelsey brought out more pointedly my reference to the continued activity of the inventor in the direction of new ways of using gas, and there is no doubt that many uses for gas will be discovered in the very near future. I do not know what prompted Mr. Kellum to make his remarks in reference to lighting. I treated on that subject and spoke of gas as an illuminant, and speaking especially on the need of education along the lines of the improved methods of controlling it. We have some lights in our office operated by a pneumatic system, and people are astounded at how convenient that is. Again, we have some street lights that are lighted from the office. As to the matter of domestic science, we are now equipping a room at the school, and the question of efficiency is what we consider. I will place a meter for every gas range, so that the girl or girls, as they use this stove, having a meter right in front of them, may see exactly the amount or consumption that is going on for any particular part of the work they are doing. Up to to-day I have borne my age so well that I have been complimented generally on my youthful appearance. This is the first time a pointed remark has ever been made in public to the effect that I associated with people in the historical age known as the stone age. I want to refute the statement right here, and I did not suppose Mr. Dunbar would accuse me of anything of that kind and keeping it concealed. As to his point, the gradual changes in methods are so slow that we do not appreciate them. Perhaps I can illustrate it by the use of the telephone. I do not want to speak of any of you as old men, but probably some of you remember when the telephone came into use. The introduction was so abrupt that the people generally hadn't an idea of what the telephone was, and when they first had the privilege of using it they would sit half a day to get a response. What is the case to-day? The telephone has been so constantly used that, when we go to telephone we expect an immediate response, and if we don't get it we start to "cuss" somebody. We expect to get connection with New York and California as soon as though they were across the lot. A person whose existence dates back to the days before the gas range, could they be confronted with this particular appliance, they would appreciate the benefit; but the person brought up in the gas kitchen does not realize that benefit, and it is our duty to let them understand what it is. As to the industrial appliances mentioned by Mr. Eves. The Improved Appliance Company made arrangements with our office to give a series of demonstrations at the various associated companies. They brought with them a full equipment. There were candy furnaces, testers, lard renderers, forges, and everything imaginable. We rented a large room and these were all set up and operated. We arranged with different shops of interested industries; that is, the butchers, for instance, came there and rendered lard; the bakers came on a special day and baked, the machinists on certain days used the forges; and all that sort of thing. In the meantime, of course, the public generally were notified to attend the exhibitions, and they were all impressed with the fact that this work could be accomplished by the use of gas, also by the ease with which it was accomplished, and by the further fact that the work performed was better, and more efficient than by any other method that could be used. I believe it would be policy if the companies situated that they could give such demonstrations, possibly not of that magnitude, but of such character, would give them. It simply resolves itself into a question of education. We should use every means to educate the people to the value of our commodity. Not knowing what we have they never will find out unless we tell them.

Mr. Thwing—In moving a vote of thanks to Mr. Cooke for this paper, I wish to express my appreciation of the amount of matter he has covered in a very small space. Every sentence here could be a paragraph and every paragraph could be a page, and it will be well worth the time of any gas man to read this paper over and over again. [Seconded and adopted.]

The President now introduced Prof. Frank C. Mathers, of the Indiana University, who read his paper on the

## PRESERVATION TREATMENT OF WOOD WITH WATER GAS TAR.

This paper gives some experiments dealing with the preservation of timber with water gas tar. Fence posts, and other farm timbers, could be treated with this tar which costs only about 3 cents per gallon as compared to 15 cents per gallon for creosote. Many farmers are shipping in cedar posts, or are paying fancy prices for locusts, while sycamore, wild cherry or sugar maple timber is plentiful. These could be preserved at a low cost so that posts made from them would last as long as the expensive posts. The U. S. "Forest Service" has made many experiments and tests concerning the creosoting of wood. In no cases do these Bulletins[1] give results with water gas tar.

The treatment of timber with preserving materials is of the greatest value in the conservation of the forests of this country. Only half as much timber will be required, if it can be treated so that it will last twice as long. Many abundant, but inferior woods, which have been considered worthless, can be treated so that they will be as permanent as the more expensive and the scarcer timber. The loss of timber through decay averages 81 per cent., against 19 per cent. for all other destructive agents, such as fire, insects, marine borers, and mechanical abrasion.

1. Application to the Forest Service; Washington, D. C., may be made for the following publications which contain very valuable and interesting accounts of creosoting tests. Circulars 139, "A Primer of Wood Preservation," 117, "The Preservative Treatment of Fence Posts," and 78, "Wood Preservation in the United States." From the U. S. Department of Agriculture may be obtained "Farmers Bulletin," 387, "The Preservative Treatment of Farm Timbers." All of these are free.

(*Continued on page* 210.)

THE AMERICAN GAS LIGHT JOURNAL

Entered at the Post Office, New York City, as Second-Class Matter.

Published weekly at 42 Pine Street, New York City.

Telephone Call, John, 2996. Cable, Am-Gas.

A. M. CALLENDER & CO., . . . Proprietors.

THOMAS J. CUNNINGHAM, ELBERT P. CALLENDER, } Editors.
SANFORD K. CAMPBELL, Associate.

CHARLES H. WADELTON, Manager.

Agents—American News Co., 11 Park Place, New York City.
Lemcke & Buechner, Berlin, Germany.
Aug. Siegle, 30 Lime Street, London, England.

TERMS OF SUBSCRIPTION.

United States, Cuba and Mexico, $3 per year. Canada, $4 per year. All other countries, $5 per year.
Single Copies, 10 Cents.

NOTICE TO ADVERTISERS.

New Advertisements and changes of copy therefor should be in hand Wednesday noon of week prior to date of issue.

NEW YORK, MONDAY, MARCH 31, 1913.

[Official Notice.]

## Fifth Annual Meeting, Pennsylvania Gas Association.

Pennsylvania Gas Association,
Office of the Secretary,
West Chester, Pa., March 1, 1913.

The Fifth Annual Convention of the Pennsylvania Gas Association will be held at York, Pa., on Wednesday, Thursday and Friday, April 9th, 10th and 11th, 1913. The headquarters will be at the Colonial Hotel. The Committee requests a prompt reply on the inclosed postal, that reservation may be made for each member attending the meeting. The papers promised are:

"High Pressure Distribution," by Mr. C. M. Cole, Harrisburg, Pa.
"Valuations of Gas Companies for Rate Making," by Mr. Grier Hersh, York, Pa.
"Industrial Gas Appliances," by Mr. E. C. Romain, Reading, Pa.
"Gas Company Classification and Accounting," by Mr. J. Wittaker, Fernley, Philadelphia, Pa.
"Demonstration of the Use of the Pulmotor," by Mr. Conner, Philadelphia, Pa.

In addition to the above papers there will be the following list of topics for discussion: "Selling Campaigns," "Lighting and Heating Appliances," "House Piping," "Advertising," "Meeting Competition," "Methods of Handling Orders in the Office," "Methods of Handling Merchandise Orders, Office to Shop," "Educating Order Men," "Prepayment Meters," "Waste Heat Boilers," "Coal Gas," "Photometry and Calorimetry in Small Works," "Checking Work Done by Order Men."

Entertainment.

*Wednesday Night.*—Theater party.
*Thursday.*—Trip to Gettysburg battlefield as the guests of the York Gas Company.
*Friday Night.*—Informal dinner and smoker. Tickets for theater and dinner-smoker $5.

The members are requested to return postal card notice to Mr. Philbrick, at once, that, with your help thus rendered, the work of the Committee may be successfully carried out.

W. O. Lamson, Secretary.

## A NATIONAL DISASTER.

The awful visitation of nature, wrought to untold frenzy, now at its highest point, in the Ohio valley and country tributary thereto, is most deplorable. Unprecedented spring freshets, greatly added to by downpours of rain that have lasted for days, have swollen ordinary streams to great rivers of incalculable energy, and the damage wrought to the low lying towns of Ohio, Indiana and Illinois, both to life and property, is appalling. In common with all other industries in that important business section of our country, the industry of furnishing light from central stations is horribly crippled. This is all the more regrettable from the fact that in times of ordinary trouble the greatest aid to the overcoming thereof is artificial illumination. It is at this hour impossible to estimate the damage that has been occasioned to the lighting trade, but a later recounting will show it in all its horrors. At time of writing (Thursday afternoon) it looks that the culmination has been reached, and in the name of the Great Controller of all, let us hope that the appearance is the immediate forerunner of fact in respect of this terrible visitation.

## BRIEFLY TOLD.

Thermal Values of Gas and Electricity.—In a recent note in "Nature" reference was made to the progress in electric cooking, and the statement was made that "The present year should see a reasonably cheap electric cooker fuel on the market to compete with the gas range, which latter, by reason of its low cost, still holds the field against the electric cooker before the general public." This statement is entirely misleading, as the question is not one of cost of apparatus, but of comparative efficiencies and comparative cost of energy in the two forms. The heat equivalent of one kilowatt hour of electric current is 3,410 B.T.U., and no more heat can possibly be gotten out of it by any apparatus. Figuring on a basis of 5 cents per K W. (about half the usual rate) you could buy for $1, 68,200 B.T.U. in the form of electric current; while from gas of 600 B.T.U. per foot, at $1 per 1,000 cubic feet, you can get 600,000 B.T.U., or almost 10 times as much for the same amount of money. Electricity for cooking or heating can never economically be a rival to gas. When that new cooker does appear they can advertise "cooking without heat."

New Economies in Coal.—The *Journal für Gasbeleuchtung* makes note of a patented process for reclaiming fuel from furnace slag. Even in the most modern plants a considerable quantity of unconsumed combustible material remains in the slag, under the best conditions probably 20 per cent., and under some circumstances as much as 60 or 70 per cent. Figuring on the coal consumed in the blast furnaces in the German Empire, the inventor estimates a possible saving of from 2 to 3 million tons per annum of solid fuel. His process consists of treating the broken slag by floating it in a liquid of a specific gravity a little higher than that of carbon. The particles rich in carbon will float off, while the heavier parts, richer in silicates, sink to the bottom. The degree of separation can be regulated by the gravity of the liquid. A test made on 2,000 tons of slag, gave the following totalings: Coke (½-inch to 2-inch) 8 tons, of a heating value of 25,000 B.T.U.; coke breeze (¼-inch to ½-inch) 470 tons, of a heating value of 18,500 B.T.U.; coke dust, 650 tons, of a heating value of 10,500 B.T.U. The coke and breeze can be burned as soon as dried, and the dust is suitable for making fuel briquettes.

Going Concern Value.—The "going concern" value of a public utility property has been discussed before all the existing Commissions, but they are not all willing to allow a fair money value for it, when determining capitalization on which to figure earnings. A recent case before the Board of Public Utility Commission, of New Jersey, was a rate hearing affecting the Passaic division of the Public Service Gas Company. In the decision the Commissioners say in part: "We can see no escape from the necessity of recognizing the intangible property designated as 'going concern' value, as well as actual physical structures similarly obtained, as constituting part of the present lawful possessions of a public utility, even though both these tangible and intangible values were built up in the past out of rates exacted from consumers, it being always assumed that the rates exacted were not legally assailed or assailable.

"The business thus acquired must be regarded as a legitimate part of the property of the company."

New York Section, "Gas Meeters."—The sixteenth meeting of the New York Section of "Gas Meeters" was held on March 24th. Some 120 members met at the Public Service Building in Jersey City at 1:30 P.M.; and after looking over that fine structure, took special trolley cars to the plant of the Wm. M. Crane Company, at Greenville. Two hours were well spent in going through this modern gas range factory, where the visitors followed the incoming pig-iron through all the departments, up to the finished range, ready for shipment. This trip was characterized as the "Most instructive that we have had." Dinner was served to 80 "Meeters" at 6 P.M., at the Down Town Club. The paper for the evening was on "Up-to-Date

Methods in Gas Range Manufacture," by Mr. H. W. O'Dowd, General Superintendent of the Wm. M. Crane Company (Mr. O'Dowd's paper is published in full on page 213 of the JOURNAL). Among others who spoke were Messrs. C. F. Terhune, Wm. F. Crane, S. W. Brown, of Columbia, S. C., W. H. Pettes, J. P. Conroy, J. M. Brock and the visiting Commissioners of the Philadelphia Section. It was decided to accept a $1 registration fee from all members of the New York Section, the proceeds to be used for general expenses and to provide the members with a badge and identification card. Announcement was made that the April meeting would be "A Ladies Night," and would be held at "Churchill's" on the 24th prox.

APRIL MEETING, NEW YORK SECTION, ILLUMINATING ENGINEERING SOCIETY.—The next meeting of the New York section of the Illuminating Engineering Society will be held on April 9th, in the United Engineering Societies' Building, 29 West 39th street, New York. Two papers will be read at the meeting: One, entitled "Light in Art," by Mr. M. Luckiesh, of the National Electric Lamp Association; the other, "Color Photography: An Examination of Screen Plates by Microscope and Spectroscope," by Mr. J. B. Taylor, of the General Electric Company, Schenectady, N. Y. Mr. Luckiesh's paper will take up the effect of direction, quality and quantitative distribution of light in illumination. These three factors in lighting will be illustrated by means of subjects taken from sculpture, architecture and painting; a few color experiments will also be given. Mr. Taylor's paper will be a discussion and demonstration on color photography and will be given in connection with projecting microscope and spectroscope.

HOT GALVANIZING AGAIN.—A new hot galvanizing process, recently patented by Professor Charles F. Burgess, differ from other previous processes in that it covers the use of an alloy of zinc and iron for coating iron or steel. The alloy, composed of about 92 per cent. of zinc and 8 per cent. of iron, is prepared in a powdered or granulated form, and is applied to the iron and steel in a similar manner to the well-known process of Sherardizing. The concern of Arthur D. Little, Inc., of Boston, who touch upon this matter in their report as Official Chemists to the American Institute of Metals, say it is claimed by the inventor that the finished coat is dense, is silver white in color and is electro-positive to iron, but less so than pure zinc, with the result that it does not corrode as rapidly as the latter, yet at the same time protecting the iron or steel equally well.

THREE NEW ALLOYS.—In their last official report, as Chemists to the American Institute of Metals, Arthur D. Little, Inc., of Boston, mention three new alloys among the various items of recent progress in the metal industry. A French patent has recently been issued covering the production of two types of alloys, from copper, zinc and silicon, which are claimed to possess great tenacity, resistance to acids and alkalies, and to be capable of rolling into finished shapes. Another new alloy has been patented by the Ajax Metal Company, composed of iron, nickel and copper which is claimed to be non-corrosive, malleable, of great tensile strength and capable of being rolled, drawn or cast. Again, a new type of pyrophoric alloy has been patented in Germany which consists of the addition of 5 per cent. metallic cerium to an alloy of manganese and antimony. The inventor claims excellent pyrophoric properties from this alloy, that essentially differs from other alloys of this type in which cerium is the main source of the pyrophoric characteristics.

OCCUPATIONAL DISEASES IN CHEMICAL TRADES.—In connection with the action of the "Committee on Occupational Diseases in Chemical Trades," appointed by the New York Section of the American Chemical Society, Dr. Chas. Baskerville, the Chairman, informs us that at the last meeting of this Committee, held on March 7th, 1913, it was decided:

"1. To notify the proper committees of the Legislatures of the States of New York and New Jersey, and the local municipal authorities, that this Committee existed, giving a list of the membership of the Committee; and to express the hope that the Committees of the Legislatures would call upon this Committee for such general advice as they might wish; and 2. To announce the objects of the Committee in a number of publications, that manufacturers might learn of its existence, and perhaps utilize its services in investigations of their own problems of this character, that they might wish carried out." Gas men may be further interested in this matter on knowing that a prominent member of the Committee is Dr. Uhlig, the clever Chief Chemist of the Brooklyn Union Gas Company.

ARC LAMP WITHOUT A GLOBE.—The latest improvement in the high pressure arc lamp is the innovation in the new Keith as lamp, the English patent for which has just been issued. In this lamp the general construction is similar to the previous designs, there being a heating chamber for the gas and air mixture, or for the primary air. The mantle, however, is inclosed in a small, transparent cylinder of fused quartz of the same shape as the mantle, only about twice its diameter, and without openings for secondary air either at its top or bottom. By this arrangement the heated mixture of gas and air is burned inside a small closed space, in whose very hot atmosphere the mantle is immersed. By the shape of this small cylinder, and the exclusion of secondary air, an appreciably higher flame temperature is secured and a corresponding increase in efficiency. The silica cups are not affected by moisture while hot, and cannot be damaged by a break in the mantle, while their shape holds the flame to the mantle in spite of the break. This will also allow of mantles of a more open texture. As indicated in the title there is no globe used except the quartz cylinder, which, in the 1,500-candle power lamp, is but 5 inches in length and about 3½ in diameter.

EXHAUST HEAT BOILER.—In a description of the power plant of a new steel works, under construction in Caen, France, it is noted that the extra power necessary at time of peak load will be provided by a steam-driven turbo-generator, using steam from boilers utilizing the heat of the gas engine exhaust. All the power for the works and its coal mines will be generated by gas engines, using probably a mixture of the furnace and coke oven gases. It is calculated that the power available from these gases will be about 30,000 kw., and that the operation of the plant will require 21,000 kw.

CURRENT MENTION—

WITH exceeding regret, just as we go to press news comes from Philadelphia of the death of Mr. William T. Robinson, for some years Secretary and Treasurer of the American Gas Company, and Treasurer of the Philadelphia Board of Trade, who passed away, at his home in Haverford, Pa., the morning of the 25th inst. He was in his 54th year, and was a graduate of the University of Pennsylvania.

MANAGER ROSCOE NETTLES, of the Tampa (Fla.) Gas Company, is being congratulated over the brilliant success that marked the practical initiation of a gas "White Way" in the greatest cigar manufacturing city in the world. The gas arcs are carried on ornamental posts, placed at proper distances on Madison street, from Tampa street to Franklin street. As an evidence that the lighting is of the really effective sort, even so conservative a man as Mr. F. S. Sanchez, head of the real estate concern known as the Sanchez-Haya Realty Company, which controls and owns scores of buildings in Tampa and its suburb, Ybor City, is anxious that the Company try a like illustration of modern public street lighting in the Ybor district.

THE Stone & Webster Corporation has taken over the properties of the Fairfield (Ia.) Gas and Electric Company. The plant will be rebuilt.

THE Coast Gas Company, of New Jersey, has arranged to construct an office building on 9th street, Belmar, N. J. The structure will be one of the finest office homes in the named place.

# Publications.

[All Publications, Catalogues, etc., mentioned below, are kept in our office for the convenience of our patrons.]

"*Laclede-Christy*" *Chain Grate Stokers*,, is the title of a 32-page, illustrated catalogue issued by the Laclede-Christy Clay Products Company, embracing a short description of their chain grate stokers.

"*Inverted Globes, Glassware, Globes and Shades for Inverted Lights.*"—A series of price lists fully illustrated, of the specialties manufactured by Gillender & Sons, Inc.

"*A Co-operative Service*," is the name of a 14-page catalogue containing illustrations of the "Garland" gas ranges, and issued by the Michigan Stove Company.

"*Clark Jewel*," Catalogue No. 88, 1913, consisting of almost 100 pages, with as many illustrations of their line of gas stoves, issued by George M. Clark & Co.

"*Eclipse Rays*," is the name of a monthly 4 page sheet, the February number of which has reached us, containing besides news matters of the Eclipse Gas Stove Company, short biographical sketches of several men positively prominent in the current vision of the gas industry.

(*Continued from page 207.*)

The cause of this decay is the growth of bacteria and fungi—low forms of plants—which require for their development air, water, heat and food. The removal of any one of these conditions will prevent the development of the fungi and the decay will be arrested. Any kind of wood will be free from decay as long as it is dry—for moisture is one of the most essential requirements for the growth of the fungi. The wood contains abundant food for the fungi, while air and sufficient heat are always present in all ordinary cases where timber is used. Where timber is not in contact with ground the water is so quickly evaporated that decay is not rapid. However, near the ground, moisture is always abundant and decay is rapid. To prevent decay, moisture and food for the fungi must be eliminated, since it is not practicable to control the other conditions, air and heat. This desired result can be attained most easily in a commercial way by impregnating the timber with creosote oil so that the food supply for the fungi is poisoned and moisture is kept out by the oil. Creosote, more properly called coal tar creosote, is the dead oil from the distillation of coal tar, or those oils having a specific gravity greater than one. It varies greatly in composition and is perhaps frequently adulterated. Heavy oils from water gas tar are said to be added. The value of the creosoting depends upon the antiseptic action of the creosote and, to the largest extent, upon the water proofing properties. In fact, after many years' service, creosoted timber looses most of its "creosote," but still contains the heavy oils which effectually keep out the water. This has led certain railroad companies in the west to impregnate ties with heavy, asphaltic crude oils. Here the antiseptic action is almost totally absent, and all beneficial results depend upon the water proofing. Water gas creosote, or water gas tar, will make the timber waterproof, but it is less strongly antiseptic that the coal tar creosote. The methods of applying creosote, as generally followed, require expensive and elaborate plants; but it is possible to obtain good results with very simple or even crude methods.

The brush method is the easiest and least satisfactory of all. It consists in applying the creosote with a brush to the thoroughly seasoned and dry timber. This work should be done in hot weather, and hot creosote should be applied in two or more coats. It penetrates into the timber only a little way and when this protecting shell is damaged the interior of the timber begins to decay. An improvement over the brush method is to dip the timber. This has the advantage that it fills all the cracks and flaws with the preservative. Again the penetration is small and the protecting action depends upon a thin shell.

Impregnation with creosote may be obtained by heating the timber in the preservative fluid in open tanks. The heating, which should maintain a temperature just above the boiling point of water, causes the air and water in the wood to expand so that a portion of this air and water is forced out. The rest contracts upon cooling thus forming a partial vacuum into which the cold preservative is drawn. The heating should be continued for at least 2 hours, or better for 4 hours, with subsequent cooling for 10—12 hours in the tank used for the heating, or cooling for 2 to 4 hours by standing in a separate tank of the cold preservative.

Only well-seasoned timber from which all the bark has been removed should be used. The bark tends to exclude the oil. Sap wood rots more readily than heart wood, because it more readily takes up water. In the same way it takes up the creosote more readily, so it can be more easily and completely treated. Round poles, which are largely sap wood, may be more successfully treated than the split timber. In fact, the heart wood is so dense that it takes up very little of the tar.

In these experiments, round lumps, or round sections, of sugar maple, wild cherry, black walnut, sycamore, beech and Michigan white cedar, were heated in water gas tar for 4 hours at a temperature of from 95° to 115°. The tar with the pieces of timber in it was allowed to cool over night.

In all cases the tar penetrated the sap wood and into the heart through all cracks of flaws. The posts or pieces of timber should be completely immersed during the heating and cooling, since the tar is drawn in more readily through the two ends than through the sides of the timber. The following table gives the percentage by weight of tar absorbed, the number of gallons required for a post 7 feet 6 inches long, and 4 inches in diameter at the two ends, and the value of the tar in each post counting the tar at 3 cents per gallon. One gallon of tar weighed 8.9 pounds.

| Kind of Wood Treated. | Per Cent. Tar Absorbed. | Gallons of Tar for One Post. | Cost of Tar per Post, Tar at 3 Cents per Gallon. |
|---|---|---|---|
| Sycamore | 65 | 4.0 | 12 cents. |
| Black walnut | 168 | 3.6 | 11 " |
| Sugar maple | 39 | 1.9 | 6 " |
| Beech | 45 | 4.2 | 13 " |
| Wild cherry | 48 | 2.4 | 7 " |
| White cedar | 34 | ... | .. |

The beech and black walnut were already partly decayed which accounts for their large absorption of the tar. Sycamore is the best wood to treat since it absorbs the tar so readily. The Michigan white cedar pole was not completely covered by the tar during the treatment so the figure for the per cent. of tar absorbed is too low. The sap was completely filled with the tar, but the heart wood did not take up the tar except through cracks and flaws. It is possible to have as deep penetration with the use of less weight of tar by removing the timber from the tar when it is only partially cool. This is not advisable when a low priced preservative like tar is being used.

Treatment of the butts of telephone or electric lighting poles would cost very little. Even painting with the tar would add years to the life of the poles. The cost of treating fence posts is very small and no elaborate apparatus is required. Methods of preparing barrels for heating can be obtained from the United States bulletins and circulars which were mentioned in the beginning.

Tar is the very best paint that can be used for a shingle roof. The writer of this paper painted a barn roof with tar 2 years ago. To-day the shingles have hard surfaces which keep out the moisture and prevent wear from the running water. This one treatment will no dout add many years to the life of the roof. A repetition of the treatment every few years would make the roof permanent.

Everyone is interested in prolonging the life of our forests. Effective ways of promoting conservation are: To make the forest products last longer and to substitute the quick growing woods or the waste parts of trees for the slower growing and scarcer timbers. A way of accomplishing this is right at hand. The proper treatment of limbs of the sycamore, maple, etc., with water gas tar, makes fence post material which should last equal to any untreated timber. Shingle roofs, gates and any other timber exposed to the weather, become very much more resistant to decay when painted with the tar. Water gas tar costs little and can be obtained from many of the gas companies which are located in the small cities of this State.

*Discussion.*

The President—This subject is interesting and vital to those who have water gas tar, and there are a good many here who have lots of it. Here is an opportunity to get a market for it. If there are any questions you would like to ask the Professor I know he will be very pleased to answer them.

Mr. Thwing—Has Prof. Mathers made any experiments or obtained any data as to the actual preservative qualities of this tar. He reports on the penetrating qualities as applied to the wood but I do not see anything as to its preserving qualities.

Prof. Mathers—Of course it will take many years to work out those things and tell how long the wood will last, but, in view of the fact that the heavy oil from water gas tar is used with creosote under the conditions as practiced in this country at the present time, it seems reasonable to think it has preservative qualities. Another fact I did not bring out. The Western railroads are treating their ties with crude oil, and they say the thing is economical. Of course, crude oil has no antiseptic qualities at all. It all depends on excluding the moisture. It seems to me the oil of this water gas tar would do the same thing that any oil would—keep out the moisture.

Mr. Thwing—I asked this because when in St. Louis, some years ago, we sold coal tar to the fishermen for the purpose of preserving their nets. In trying to substitute water gas tar for it the result was that the fishermen were going to sue us for damages, because it destroyed the seines.

Mr. Dykeman—A question about the drying qualities of this water gas tar. I notice, from Prof. Mather's hands, that the black seems to come off his samples. It seems to me that the fact that it does not dry would interfere with its usefulness.

Prof. Mathers—It dries in the course of a short time. These have not been made so very long; this tar has simply to be absorbed. I think in a short time it would be perfectly dry.

Mr. Dykeman—I fear it would leave a smut on the outside.

Prof. Mather—I have put it on roofs for shingling, and it finally dries with a very hard surface. Then it does not rub off.

The President—Does any one else wish to discuss this paper or ask any questions?

Mr. Dunbar—Prof. Mathers spoke to us about our being able to use sycamore timber, through its being preserved with water gas tar. I always thought that sycamore, aside from firewood, was practically valueless. I wish to ask the Professor if I am correct in my understanding, in which event this preservative by means of water gas tar is an advance that will add to the wealth of our country and our community as well as to the gas companies that are enabled to dispose of such product.

Prof. Mathers—Sycamore happens to be a timber that will take in more creosote than any other wood. Some soft woods in the West will absorb more. Any wood when treated with the creosote or preservative will weather much better and that is the reason I think sycamore is the best. It happens those are very straight trees along the streams, and the fact that they take the oil so much more readily makes them appear good.

Mr. Dunbar—Of what use has sycamore timber been?

Prof. Mathers—I am not familiar with that. It is often sold for certain purposes. It has quite a nice grain when quarter-sawed. It is bought by the mills in my town, but I am not just familiar with its uses.

Mr. Parker—There is no question about Professor Mathers' paper being of great value, not only to the gas men but to the country as a whole, being in the line of the conservation of the forests. As a matter of fact, this is not a theoretical discussion. The use of water gas tar for the preservation of wood was made at one works I am familiar with about 13 years ago very extensively. At that time it was perhaps even more important than now, because the sale for water gas tar is better than then. But I believe, at the prices Prof. Mathers named, its use for these purposee would not be so desirable, because we can realize that price, selling it for other purposes as a rule. The superintendent of the plant I had in mind had a hobby of the preservation of wood, and he was enabled to sell the entire output of water gas tar of a large plant to the farmers in the vicinity for painting the roofs and sides of their barns, the fence posts and the like. I wish, as Mr. Thwing said, we had actual figures on the relative value of the water gas tar as a preservative, and the creosote. One reason why creosote is not used more is its expensiveness. There would no doubt be a great deal of creosoting done if water gas tar were equally effective than is done at present. While we have not the actual figures, we have Prof. Mathers' authority for his statements, and I think we should thank Prof. Mathers and Mr. Moncrieff for giving this to us. I am sure if any one who has water gas tar makes it a hobby, as this superintendent did, that he can sell all he has to a good advantage.

A Member—I put down some yellow pine paving block treating it with water gas tar, in 1905, in New Orleans. When there last January the blocks were still in good preservation, and they got all the traffic of the road. I believe water gas tar will preserve a block as a paving proposition as long as the blocks will wear.

Mr. Parker—I should like to know if any tests were made of temperature.

Prof. Mathers—This heating was done at a little above the boiling point of water, to bring out any water that happened to be in the timber. We really get a pressure system of heating until we bring out the water. I think it would be very effective at about a temperature of 212° F. Of course, it would do some good simply painted on, but that would not give it penetration.

Mr. Eves—I would like to say that Mr. William Watson Woollen, President of the Indiana Nature Study Club, would have been pleased to be present this morning to discuss this paper, but was unable to attend. He, with the other 100 members of the Nature Club, is very much gratified by the fact that the Indiana University is taking this matter up, because of its relation to the matter of the conservation of the forests.

(To be Continued.)

# Special English Correspondence.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, ENGLAND, March 10, 1913.

*Gas or By-products?—New Light on Fresh Air and Ventilation.*

It is certain that the ensuing summer will witness remarkable developments in the coke industry of this country, and that before next winter the gas, produced as a by-product, will be taking the place of town gas as manufactured in the ordinary course, in more than one district. There are rumors of a large undertaking in this direction in South Wales. Since the introduction of the by-product oven, there has always been a strong prejudice amongst managers of iron smelting works, in favor of the old or beehive type of coke oven, and it was roundly asserted that coke from the new pattern oven must of necessity be of bad color and quality. For the supply of cupolas 50 feet or more in height, taking charges of several tons of heavy ore, it is indespensible that fuel must be hard enough to resist great weight without crushing. Possibly the first efforts in the direction of collecting and utilizing the waste gases gave some grounds for suspicion, but the early difficulties have been vanquished, and it is now generally recognized that there is no impossibility about a yield of high quality hard coke from the by-products ovens. This is a long step in the direction indicated last month, that the values of residuals have now reached a point at which they threaten to eclipse that of the primary product. Tar is increasing in value on account of the extensive demand for the public highways, being the only material available in practice for the construction of a satisfactory trackway suited to the rapidly increasing moter traffic. From a similar cause arises the large demand for petrol, and its phenomenal increase in price, which has directed attention to the suitability of bonzol for use on motor cars. And there is a rapidly extending appreciation amongst home agriculturists of the value of pure sulphate of ammonia for the preparation of fertilizing materials. Such a promising outlook naturally attracts the attention of coal owners and capitalists, and they are likely to follow the example set by gas undertakings, in the way of breaking and sorting coke, working up ammoniacal liquor and sulphate, and dehydrating or distilling tar. Contractors and manufacturers of gas appliances are all seeking for a share in the orders for necessary apparatus and plant, and they are likely to have a good time. The only thing to be feared is that the production of benzol, tar and ammonia, may out run the demand with the usual depressing effect on the market, but there is no fear of anything in this way at present.

In this connection a new departure made by the Bournemouth Gas Company is interesting. In a circular issued to all their customers, after remarking that the present high prices of coal are likely to be permanent to some extent, they go on to say that with a view to meeting the demand for a clean economical fuel, they have introduced a new process whereby a form of fuel is obtained which differs very considerably from ordinary gas coke, and is called charcoke. It is formed in special retorts working continuously, and the residual is finally qnenched in sealed vessels by means of external air currents, instead of by the old method of water quenching. As a result of these special conditions charcoke can be readily ignited by an ordinary fire lighter, and gives a clear bright hot fire and a large proportion of radiant heat. Rise of temperature may be transmitted by connection through the medium of the air, or by radiation direct to the objects to be warmed, and radiated heat is the most healthy and efficient method of application, as exemplified by the rays from the sun. With charcoke a fire is obtained which gives a maximum amount of radiant heat from each pound of fuel consumed. It is clean to handle and bulks larger than ordinary coal or coke, yielding about 24 large sacks to the ton, and is carefully graded to a comparatively small size similar to the grade of fuel used in French households. Arrangements are made for prompt delivery of orders in all parts of the district.

Perhaps under this state of affairs it is not surprising that a lecture delivered to the Manchester and District Farmers' Gas Association at Manchester, by Principal J. W. Graham of Dalton Hall College, on the hygienic aspect of gas, should include a bulky addenda devoted to the uses of coke and other smokeless but solid fuels, and that the addenda attracted more attention in the subsequent discussion, than the subject proper of the lecture. The lecturer began with a cryptical statement to the effect that the hygienic value of gas was derived from what it does not contain, rather than from what it does contain, and illustrated this point by describing the un hygienic consequences attendant upon the usual methods of burning raw coal. Not only is the process objectionable on account of the production of soot, smoke, unburnt gases, corrosive acid vapours, etc., but a greater part of the volatile products go up the chimney and are worse than wasted. Referring to the necessity for a pure air, he mentioned that a human being breathed into and passed through the delicate passages of the lungs, six times the weight of air that he took of food and drink. He also referred to the hygienic effects of unobstructed sunshine, and to the relation between smoke and fog. He advocated the encouragement of the free use of gas by selling it at the lowest possible price, and referred to high priced gas as a tax on air and sunshine. But there were two great difficulties to be met before gas could supersede coal for domestic purposes. There was a strong

prejudice in favor of the cosy portable fire afforded by solid fuel, and in the working man's cottage the one fireside was also utilized for cooking and for providing hot water. The other difficulty was the disposal of the residuals from an enormously increased production of gas. This could be avoided by the adoption of distillation at a low temperature and the production of a coke containg 10 to 15 per cent. of volatile hydrocarbons. He was evidently referring to coalite, and claimed that a gas of 750 *B. T. U.* could be produced by the coalite process at a cost of 4¾d per 1,000 cubic feet, whereas ordinary gas of 600 *B. T. U.* cost 10¼d per 1,000 cubic feet. The commercial failure of coalite was no discredit to the process. He claimed that high temperature distillation was a wasteful process, in which valuable constituents were destroyed in order to produce a greater volume of hydrogen and carbonic oxide. He believed that the smoke evil was the most curable of all our great natural troubles.

Discussion being invited, Mr. Hollingworth remarked that the combustion of raw coal might be attended with the production of nearly 1-tenth its weight of sulphuric acid, which would escape into the atmosphere and be condensed on surrounding objects. But if gas was used in place, the greater part of the sulphur would be retained at the gas works, and the only part that might get into the atmosphere was that contained in the coke. He suggested that the lecturer had not mentioned one important advantage peculiar to gas, and that was the sterilizing effect of the gas flame. Cultures taken from air before and after passing a gas flame showed that in the first case it was full of bacteria, but in the second it was absolutely free from germs of any kind. Mr. J. McNicholl said that low temperature gas meant only half yield, and therefore double the quantity of manufacturing plant, double the wages, double the quantity of coal stored and handled, and double the yield of tar and ammonia. Mr. James Taylor said gas engineers were not prejudiced against low temperature distillation, but they had not been satisfied that it was a sound commercial proposition. He thought ordinary coke would do all that coalite could do, and that the difficulty either in regard to coke or coalite was that it was not popular. There was prejudice to be overcome, and the first thing was to create a demand.

There is no doubt that in a variable climate like ours, it would not be practicable to deal with a large heating business on account of the fluctuating demand. Gas undertakings running a lighting and cooking business can comfortably tackle say 20 per cent. of heating in addition. But put the thing the other way about and assume that the heating business represented 80 per cent. of the whole. The variations brought about by a frost one week and a mild south wind the next, would be greater than any known system of manufacture or storage could deal with on a commercial basis. A more elastic system, or one cheaper in respect to first outlay and stand-by charges would be required, as the plant necessary to supply say 100 millions per annum, would have to be doubled. Under present working we can get through comfortably with a plant equal to half a million per 24 hours, but this would not be equal to a 6 weeks frost. When one reads about the advantages of low temperature coke as compared with the usual gas works article, one wonders how it was that this was not discovered during the 60 or 70 years that iron retorts were used in gas works, instead of being regarded as not much better than rubbish. No gas undertaking, at the time when they were making 8,000 cubic feet per ton, could get anything like the current prices for gas coke. Also it is difficult to see how a coke containing half the volatile matter present in the original coal can be said to be smokeless. Can it be claimed that the first half carries off all the objectionable matters that go to make soot, tar, and sulphur acids, leaving a second half that is innocuous in these respects. Principal Graham does not appear to be aware that while professors have been talking, gas companies have taken very important strides in the direction of smoke abatement, and towards meeting of the cottagers demand for cooking and hot water, not necessarily at one fire place, but with simple combinations of two or three appliances.

Mr. W. J. A. Butterfield concludes an article in the *Surveyor and County Engineer*, by expressing an opinion that, at the present market values of tar and sulphate, and provided that the semi-coke can be sold at a price equivalent to not less than 75 per cent. of the cost of good coal on the spot, there is reason to suppose that a low temperature scheme could be worked in many localities. But the plant must be so designed as to admit of the coal being distilled to the required degree at no greater expenditure, on account of capital charges, wages, and working expenses, than the corresponding expenditure on the same weight of coal in gas works. Any plant that does not allow the coal to be charged into the distillation vessels and the semi-coke removed from them entirely by mechanical means is not likely to fulfil this condition.

The question of pure air and ventilation must always have some association with heating and lighting problems. It is a common saying that the wisdom of one generation is the folly of the next, and on no important question has this been more aptly illustrated. Hygienic experts have taken an enormous amount of trouble during the last 50 years, to devise methods of accurately determining carbonic acid to the third or fourth decimal place, and of counting the bacteria or other germs, and have arrived at rules indicating what is or is not a pure atmosphere. Yet such a distinguished authority as Professor Leonard Hill, Professor of Physiology in the University of London, writing to *Public Health*, says that exhaled air contains no organic chemical poison and that the present age of carbonic acid in the air of a crowded room has nothing to do with the discomfort felt. Man likes to ascribe the cause of illness to some mysterious essence, and refuses to recognize the harmfulness of that which gives him pleasure and comfort at the moment, over-warmth and excessive feeding. The proofs of the harmful effects of over heated, moist, or excessively dry atmospheres are abundant and incontrovertible. He says that it makes no difference to a man at rest if the oxygen in the atmosphere is reduced to 13 per cent. For many years it has been asserted that the healthfulness or otherwise of the atmosphere depended upon the proportion of oxygen, and this idea has been exploited by parties opposed to coal gas, who talk largely about the destruction of life giving oxygen. Professor Hill is by no means alone in his belief, for it will be remembered that Dr. Harger has proposed to add 1 or 2 per cent. of carbonic acid to the air supplied to coal mines as a means of reducing the risk of fire or explosion. The experience of gas engineers confirms this view, for they can all give instances of persons living and working in buildings where large quantities of gas are consumed, frequently without other means of ventilation than that caused or accelerated by the gas and yet enjoying a degree of health above the average. It has been observed in the Lancashire mills that the absences on account of sickness, where gas is used, are much lower than in other cases where another method of illumination is preferred. These facts should be brought to the notice not only of present users, but of every prospective user of gas, because by the use of modern appliances both the degree of heat and of moisture in the air of a room can be accurately controlled.

## New Methods and Appliances.

A Test of Surface Combustion.—From *Engineering* of March 14th we take the following table, showing the results of some tests, made in London, on a gas fired "Bonecourt" boiler. This boiler had ten 3 inch tubes 3.22 feet in length, with a total heating surface of 21 square feet. In these boilers the tubes are filled with fine clay or other refractory material, and the mixed gas and air is converted into heat energy by flameless surface combustion, showing a high degree of thermal efficiency.

| | | | | |
|---|---|---|---|---|
| Date | 1-8-13 | 1-9-13 | 1-10 13 | 1-13-13 |
| Length of test | 6 hours | 3½ hours | 6 hours | 6 hours |
| Pressure of mixed gas and air, inches | 40.9 | 42.3 | 40.7 | 40.2 |
| Pressure at back of boiler, in | 5.14 | 5.3 | 5.1 | .... |
| Temp. at back of boiler, F | 534 | 558 | 565 | 568 |
| " " " econ'izer. | 289 | 289 | 286 | .... |
| Gas used, cubic feet | 8,700 | 4,970 | 9,310 | 9,820 |
| " " at 0°, 760 m.m. | 8,380 | 4,770 | 9,030 | 9,480 |
| Heating value at 0°, 760 m.m. | 510 | 516 | 516 | 523 |
| " " of gas used, B.T.U. | 4,270,000 | 2,470.000 | 4,670,000 | 4,970,000 |
| Steam pressure, pounds | 103.1 | 113.8 | 112.4 | 43.8 |
| Temperature of water at inlet of economizer | 48 | 49 | 49 | 46 |
| Temperature at outlet | 143 | 120 | 119 | .... |
| Water converted into steam, lbs. | 3,490 | 1,980 | 3,690 | 3,720 |
| Per sq. ft. of heating surface, per hour | 27.7 | 28.8 | 29.3 | 29.5 |
| From and at 212° F | 33.9 | 35.2 | 35.8 | 36.0 |
| Heat utilized in boiler, B.T.U. | 4,080,000 | 2,315,000 | 4,320,000 | 4,370,000 |
| Efficiency, per cent | 93.3 | 93.8 | 92.5 | 87.8 |

Some Properties of Carbon Monoxide—The Bureau of Mines has recently published some interesting data on the subject of mine gases, and particularly on the means for detecting the presence of Carbon monoxide or white damp, in mine atmospheres. This gas (CO) is the main combustible ingredient of water gas, producer gas, and blast furnace gases. It is found in mine air only after explosions and, being both colorless and odorless, its detection is diffi-

cult. Even miner's safety lamps fail to indicate its presence unless in very large quantity. The best and simplest test for its presence is to pass the suspected air through a solution of two drops of blood in 100 C. C. of water, the CO turning the solution pink. This pink color is also given to the blood of a person inhaling the gas in dangerous quantity, and for the following reason. Oxygen, when absorbed by the lungs from the air breathed, forms an unstable chemical compound with the red corpuscles in the blood, and is carried by blood to the body tissues. These red corpuscles or haemoglobin have a greater affinity for CO than for O (about 250 times as much) and also form a more stable compound with it, than with the O.

When we breathe air that is contaminated with CO or, say, with illuminating gas containing a large percentage of CO, this is what takes place: As the air is drawn into the lungs, oxygen is absorbed, but in less degree than is normal, because of the great affinity of the blood for the CO; as breathing is continued the O is further supplanted, until there is none of this nourishing gas carried to the tissues, and toxic effects are noticed, and if further continued death will result from stopping the supply of O.

Take a man breathing 15 pints per minute of air, containing, say 10 per cent., of a gas carrying 30 per cent. of CO, 60 per cent. of the CO breathed will be absorbed by the blood, and 1 pint is sufficient to half saturate it, rendering the man too weak to stand or walk. In such an atmosphere he would be "knocked-out" in about 4 minutes.

The difficulties met with in resuscitating such cases is the sluggishness of the blood in taking up new O to replace the more stable compound of the CO.

---

UP-TO-DATE METHODS IN GAS RANGE MANUFACTURE—[A paper read by MR. H.W. O'DOWD, General Superintendent of the Wm. M. Crane Company before the Gas Meeters, New York Section, at Jersey City, N. J., March 24.] Your President has requested that a paper be read to you on "Up-to-date Methods in Gas Range Manufacture." I have been delegated as the unlucky one to read it, and you, as the unfortunate ones, to listen to it. I believe your President was very unfair to suggest such an article, as I know of no other line of thought on which there can be as much diversity of opinion outside of a thesis on the practices and beliefs of religion. Therefore, in approaching this subject, I do so with fear and trembling.

While I have been in the gas appliance manufacturing line for 23 years, I can confess that the longer I am in it the less I know and the greater the effort required to keep up with the band wagon. Each and every year, I look forward to the ideal of a "Universal Range" in its truest sense, and just when I begin to believe that it has been attained, some of you "Gas Meeters" come forward suggesting changes to meet the demand or requirements of the party on the outlet side of the meter. Of course, I can appreciate your position, but the position which the manufacturer is forced into by these suggestions and requirements calls for sympathy.

The gas company is in the same enviable position as the Ford Motor Company. They know their cost of production before they produce. They only make one article and of one quality for which they do not have to find a market. The market is all around you. The means of distribution already determined, the forces already efficient, with a means of determining output. The Ford Motor Company make one type of car; have their distributing agencies established; but they must make their own market. The manufacturer of gas ranges does not know from month to month what he will be called upon to supply. Whether his output is to be 400 ranges per day, 50 a day or none. He does not know whether his types or styles of finishes, designs or methods of manufacture are going to be the same in 1914 as in 1913. Instead of being like Ford, making one type of car, he is called upon to make between 400 or 500 different styles, sizes, types or finishes, and then adjust them to meet the requirements and necessities of the different pressures and qualities of gas throughout the United States.

This multiplicity of types, styles and sizes has increased cost of production, decreased storing capacity, increased raw material, decreased the facility of filling orders, and practically put out of the reach of the manufacturer the adapting to his business of manufacturing that which has become absolutely essential in other enterprises, viz.: Mass production with its tributary essentials of standardization and specialization. In other words, the making of gas ranges to-day is not by manufacturers, but by jobbers. To meet the demands made by buyers or purchasing agents who, while they want the goods, will not pay more for them, proprietors have been forced to add more capital to their business, to do a greater gross business with a less net profit. You may ask how this can be. Every change or design, type or size means new patterns, flasks, match plates, core boxes, dies and multitudes of other appliances, and relegates to the scrap heap a whole lot of invested capital before the manufacturer has had time to wipe it out by yearly depreciation, necessitating the putting of a large amount of capital on the liability side of the ledger. His new designs or machinery have not increased his business, but barely allows him to retain his business and keep his head above water.

It has been my privilege to watch the evolution of the gas range, from the little 2-burner range with 12-inch square oven, to the present cabinet style, with its 20-inch or 22-inch ovens, with 6-burner top, canopy, etc., and also to have had charge of the reconstructing of the types from year-to-year, studying methods of manufacturing, interchangeability, standardization and specialization, but to my sorrow no *mass production*.

The following comparison of past methods with the present will illustrate "Up to-date Methods of Gas Range Manufacture." In a manufacturing plant, starting in the foundry department, we find, first, the transition from the old box like flask to the snap flask, from the gated pattern to the heavy iron match plate, thence to the light aluminum match plate. Then from floor work to bench work, to the molding machine practice, back to matchplate with the addition of a vibrator to facilitate the drawing of patterns, and then to the present combination of molding machine with matchplate and vibrator, increasing output from 30 to 100 per cent.

Another department of the foundry which has developed in the last 10 years is the core department. That is the department which makes the cores from which we obtain corded castings, such as the range top and oven burners. The majority of you remember the old type of range burner made in two pieces cemented together, with wrought iron pipe mixing tube and separate air mixer. The present one piece, cored burner is the result of attention and thought given to this department. Improvements in manufacture are apparent in this department by the development of the multiple core box, increasing output 25 to 50 per cent., and the practical elimination of wires for supporting and venting core, by the use of the stamped core vent helped by methods of construction.

These two departments—that is, the molding room and the core room—are the two manufacturing departments of the foundry. Aside from improvements in melting, cupola practice remains the same as it was 20 years ago. Study, however, has been given to quality and strength of iron, and we have increased the transverse breaking strain of our castings from 2,200 lbs., which is standard, to 3,400 lbs. per square inch—over 50 per cent. You all probably know the methods of pouring iron from the ladle after it has been melted in the cupola into the mould through the sprue hole, which sprue communicates with the gates which of themselves communicate with the pattern, and how castings after they are dumped from the mould are carted into the cleaning room to have the sand cleaned from them; how they are placed in rumbling mills and rumbled by the hour with jacks, such as your children play with; how the gates are removed by grinders or snaggers, and then turned over to an inspecting department for examination and for the elimination of defective castings. An improvement of great value in the cleaning of castings which has helped the sales end is the development of the sand blast. This device enables the removing of sand which cannot be removed in the rumbling mills.

In the factory, departments can be subdivided into machinery department, grinding, polishing and plating department, punch press department, sheet metal department, assembling department, japanning, testing and inspecting.

The machinery department receives its castings such as frames, doors, burners from the foundry, and raw material such as pipes from the stores department. These parts are drilled, tapped, cut, threaded, etc., as occasion requires, and forwarded either to stock room, assembling department, or polishing and plating department as the case may be To-day where multiple operations can be done in the machinery department, machines or tools are supplied. Years ago each hole in a gas burner was drilled separately. Now, we drill 64 holes or more at one time. In another appliance, 14 one-quarter holes are drilled in one operation. This method of multiple operations is used on circular, straight line or star burners, but so far, no engineer has been able to drill angle holes and straight holes in either a circular or star-shaped burner in one operation.

Years ago, manifolds and nipples were cut by hand-operated ma-

chine. We now use power-driven cutters and threaders, increasing output and decreasing cost per operation. The holes for the stopcock instead of being drilled separately and threaded separately are now done in multiples. While one manifold is having the 5 holes drilled, another manifold is having the 5 holes tapped and all at one time.

Improvements in the polishing or plating departments show less progress than in any other departments. Here, by a new style of wheel or a better cutting emory, or by changing of design, we have been able to increase output, as we have also done by specialization of work. The same applies to the buffing room. In the plating room still less progress is shown. While supply houses have brought out labor saving devices, such as plating barrels and continuous plating baths, they are not adaptable to gas range manufacture, owing to its diversity of styles, shapes and sizes. We hear of rapid plating salts or special cleaners, but on trial the majority show some quality that is detrimental and would deteriorate on gas ranges. Chemists are now endeavoring to bring out a non-corrosive nickel and possibly in the next 5 or 10 years we will have it.

In the punch press department is shown the greatest improvement over old methods, which improvement is the result of standardization by the manufacturer. It does not require a very great imagination to see the advance made from the old method of using a sheet metal pattern of a range jacket, carefully laying it on top of another sheet and weighting it with block of iron or clamping them together with clamps, taking a scratch awl and making every notch or piece which must be cut off, taking a prick punch and centering where every bolt hole or edge must be thrown, then mark whether hole is to be $\frac{3}{16}$ or $\frac{1}{4}$, the taking of the sheet to a hand operated punching machine and punching each hole separately and then to a bench to have notches cut by hand shears, from there to the brake of folder to be formed, to the present method of putting a sheet of iron into the press and have every notch, hole or opening cut and pierced at the rate of two or three a minute. To a proportionate greater or lesser degree, according to the construction of the piece, the same methods are employed in making all the sheet metal parts of the standard ranges, employing punch presses costing from $100 to $2,500, and plain piercing dies, blanking dies, combination dies, etc., making the cost of equipping a half-way up-to date plant about $40,000.

Now, if you keep this method of manufacturing before you, you can readily see how a request for a special design, type or construction in a range, throws our method of manufacture back to old methods, increasing initial cost in manufacture and decreasing output per square foot of plant space, increasing overhead expense and decreasing returns on capital invested.

Another big improvement in gas range manufacture is the exterior and interior finish. In the exterior finish from a plumbago or graphite stove black which blackened the hand of the salesman or demonstrator, to the present lacquer or baked rust-resisting japan or enamel, and on the interior from the old black iron finish to the white, clean aluminum baked finish.

In the assembling department we arrive at the end of gas range manufacture. Here are assembled parts from the foundry, parts from the machinery department, press department and sheet iron department, and here we prove whether our methods of manufacture from a mechanical point of view are correct. Do the parts assembled go together without straining, pulling or wrenching? Do the holes in the sheet iron parts register with holes in castings? If so, you have manufactured a range which will act under heat the same as when cold, no warping or straining of parts which, in time, deteriorate the range under the excessive stress it is subjected to when heated.

After the range is assembled, the fitting of cast parts to cast parts is taken care of, such as fitting doors, side shelves and top grids. The burner rods, manifolds and burners are put on, and oven manifold lined up to receive oven burners by truing them up by jig arrangement whereby every stopcock is brought into a straight line and centered; a big improvement over the old method of taking a chance of having the gas delivered into the burner at such an angle as to foul the mixture. From there, the range goes to the testing tanks where it is tested for leaks under a pressure several times greater than to which it will ever be subjected. Every burner is ignited to prove that every hole is clear and that each burner is equipped with its proper orifice. Then it is sent to the finishing department where all finger marks are wiped off the nickel work, where jackets are cleaned and rubbed over with anti-rust liquid, and where it is inspected for defective finish of the blacking or material before it takes its trip to the storage room or shipping floor.

The same method of operation and movement is employed in all up-to-date range factories just as soon as they are in a position to standardize the output, and the same method of specialization of labor operation is followed and employed, viz.: Designers, pattern makers, pattern fitters, carpenters, molders, core makers, cupola men, cleaning room men, grinders, platers, buffers, punch press hands, power shear workers, tinsmith or sheet metal workers, tool makers, machinists, lathe hands, drill press hands, mounters, manifold assemblers, trimmers, testers, inspectors, making the gas range industry a complicated one, employing a greater diversity of trades than any other business using iron ore as its fundamental basis.

As a closing illustration of the vast amount of detail in this line of business, I would state that a few years ago, I was following up cost system and amongst the literature I read, was an article by a system concern (having branches all over the world) who made the statement that after systematizing their own factories, they were in a position to back up their statements as to the reliability of their system and methods as instanced by the fact that in their factory it was necessary to follow up 2,318 different items of manufacture. I started to draw together and classify our different items and found that we had 14,000 to follow up, and this did not include any finished goods, flasks or patterns; showing the vast amount of energy, thought, study, capital and losses which the manufacturer has given to still maintain his present selling costs, and the sacrifices he has made in a passive manner to enable the gas industry to reach its present pinnacle and magnitude, giving employment to the brainiest men we have in accountancy, science and salesmanship.

## Items of Interest
### FROM VARIOUS LOCALITIES.

A NOTEWORTHY decision was recently handed down by the Board of Public Utility Commissioners of New Jersey, in the instance of the complaint of the City of Newark vs. Public Service Electric Company, and Public Service Gas Company. The public buildings of Newark obtain their supply of gas and electricity from the named Companies, and quantities of electric current and gas current are charged to each building, as if each were a separate consumer. The buildings are located in different sections of the city and at great distance apart. It was submitted that the named Companies had established rates of discounts, the latter increasing as the consumption increased, and that if the consumption in the several structures was combined the rate of discount would be larger than the several discounts allowed at the various installations. It was contended that the consumption of gas and electricity should be so charged as to give the city the benefit of the maximum discounts. The Board held that if this were allowed it would constitute a discrimination in favor of the city, unless the same rule was applied to every owner of more than one piece of property.

---

"B. M. B.," writing from Rochester, Minn., under date of the 24th inst., says: "The increasing demand for gas in this thriving city, thanks to the cleverness of the way in which the residents have been taught as to its many advantages, has obliged the Company to enlarge its generating capacity. Accordingly contracts have been entered into for an additional bench of 6's. The distributing system's efficiency will be greatly increased by the placing of a 12-inch line of pipe from the works to Broadway, which will readily give a maximum of 3 inches pressure at the furthest section of delivery. Its new office building, which is being constructed by the Schuster Realty Company, will be ready for occupancy by May 1st, is a real gem. In it ample provision has been made for the proper displaying of varied line of gas appliances; and, take it all-in-all, the people of Rochester have much for admitting that the proprietors of the Rochester Gas Company are of the progressive sort."

---

ON the 18th inst. the voters of Clinton, Ia., by a vote, the ratio of which was 4 in favor to 1 against, sanctioned the new franchise under which the Clinton Gas and Electric Company will operate for the next 25 years. The result amply determined whether or not the way in which this corporation is operated by Manager Thomas Crawford and his associates is satisfactory. The Company will immediately go on with the improvements contemplated, which involves an expenditure of many thousands of dollars; in fact, the cost of the betterments to both sections of operation will not be far from $200,000. Under the agreement the Company binds itself to gas at 90 cents (net) per 1,000; an electric current medium of 75 cents, a reduction equal to 10 per cent.; and the placing of 23 additional street lamps without any charge therefor to the city; the removal of all obstructing poles in the Company's mains lighting and power district in Second street. In acknowledging the result and its obligation Manager Crawford made the following public statement the morning after the election: "The Company certainly feels gratified for the loyal support given from all quarters, and will endeavor to give careful attention to all complaints from consumers on account of service, wished for extentions and the like. The gas service will be as well conducted and managed as it is possible to do."

---

THE Lloyd Construction Company, of Detroit Mich., will install at the plant of the Racine (Wis.) Company a washer-cooler and intensive scrubber up to passing 2,600,000 cubic feet per day. The same contractors will put in the Pontiac (Mich.) plant 2 steel concrete purifier boxes, 20 feet by 20 feet in dimension.

---

CHAIRMAN IMBUS, of the Cincinnati (O.) City Councils Lighting Committee, has induced the local gas company to in future make

main extensions 75 feet in length for all prospective consumers. Heretofore the limit in such cases was 50 feet.

THERE was no opposition in the Connecticut State Senate respecting the measure permitting the New Haven Gas Light Compny to increase its capital stock to $10,000,000 from $5,000,000.

MR. GUY BABB has resigned the position of Manager to the Rochester (N. H.) branch of the Strafford County Gas Company. Mr. E. C. Andrews, of Somersworth, succeeds him.

AT a recent session of the Middleboro (Mass.) Town Council, it was voted, at the instance of Mr. George F. Tucker, to appoint a committee of 3 to confer with the Brockton Edison Light Company, in respect to these two proposals: For the purchase of the municipal gas and electric plants, and for supplying all the gas and electricity supplied by the municipal plant, the committee to report at its speedy convenience.

THE heads of departments of the Boston Consolidated Gas Company enjoyed a splendid dinner served in Young's Hotel the evening of the 19th inst. Over 50 were seated, and the speaker of the evening was Mr. Edgar L. Wrightington, Second Vice-President of the Company, whose theme was "The Work of the Appliance Department."

WE understand that the proprietors of the Kingston (N. Y.) Gas and Electric Company are considering the purchase of the properties of the Ulster Electric Company, of Saugerties, N. Y.

"B. J. H.," forwards this from Fairfield, Ia., under date of the 20th inst.: "The Fairfield Gas and Electric Company is no longer a home concern, for as soon as the details can be arranged all of the Fairfield owners of the corporation will have relinquished the property. September 10th, 1908, E. A. Howard and other Fairfield residents purchased the Fairfield Gas and Electric Company from Messrs. Jones and Hovey, with the idea of improving the service. The new owners at once put the plant in proper shape by virtually rebuilding it as to the gas division, and absolutely reconstructed the electric section. The change was immediately appreciated by the people, who gave to it sufficient patronage to enable the enterprise to become profitable. The present purchasers are the Stone and Webster Corporation."

"B. B. B.," sends us this from Houston, Tex., under date of the 12th inst. "Early this month, after a service commencing in 1906 Maurice Levy resigned as publicity man for the Houston Gas Company to engage in business on his own account. Shortly after his resignation Mr. Levy was presented with a handsome watch charm pendant of an Elk's charm set with diamonds by his fellow employees. Mr. Levy who is one of the best known advertising and publicity men of Houston has put over quite a few original stunts in his line and has made the text 'Cook with Gas' familiar with every newspaper reader in Texas. He was assuredly a most popular man."

ADVICES from Harrisburg (Pa.) under date of the 20th inst., are to this effect: "On the evening of Tuesday last the Harrisburg Gas Company was the host at a reception and dance given in its South Market Square offices, to the families and friends of its employees. The entertainment features of the evening consisted of a Victrola concert, impersonations and humerous recitations by Harrisburg's well-known humorist Frank H. Hoy. Also an illustrated lecture by the Rev. M. D. Lichliter, whose topic was the Yellowstone National Park. At the conclusion of the lecture the spacious second floor of Company's offices was cleared for dancing, and at an appropriate hour light refreshments were served.

CONSTRUCTION work on the plant of the Port Arthur (Tex.) Gas Company is under way. Mr. J. S. Connelly, who is in charge of the work, says it will be completed by September.

AT last the inevitable seems to have happened. Certain changes in the ownership of the Indianapolis (Ind.) Gas Company, and in that of the Citizens Gas Company, of Indianapolis as well, will apparently put an end to the insensate competition that has existed in the gas supply of that city for 10 years or more. It looks that the Benedict interests have been eliminated and that the Company is again in the hands of local people. The new Board of Directors is thus composed: Volney T. Malott, L. C. Boyd, Gavin L. Payne, Arthur V. Brown and W. G. Irwin. Mr. Carl H. Graf, who has been Manager of the Company during the eastern ownership thereof will continue in that capacity.

THE voters of Laurel (Miss ) by a vote of 229 to 32 rejected the petition of W. R. Harrison, Jr., for the right to operate a gas works in Laurel. The maximum rate in this franchise was put at $1.50 per 1,000. In a few weeks the voters will again consider the franchise asked for by John Bacon and associates, of Cincinnati. Their franchise names $1.20 as a maximum.

GOVERNOR FOSS, of Massachusetts, has signed a bill which prohibits gas companies from making meter installation charges to consumers whose bills for gas amount to $7 per annum.

GOVERNOR MAJOR, of Missouri, has signed the measure creating a Public Utilities Commission for that State. The measure is in general modelled along the lines of the New York State Commission law. It provides for the repeal of the Cooper Enabling Act passed May 8th, 1907, under which the present local commissions were established.

THE Directors of the Roanoke (Va.) Gas light Company, at a meeting held the 25th inst., declared a regular quarterly dividend of 1½ per cent. on the outstanding preferred stock of the Company, payable the 1st inst.

"F. R. D.," writing from Wilmington, Del., under date of the 22d inst., says: "At least 100 members of the working force of the Wilmington Gas Company met in Hanna's Café early this week, the occasion being an informal dinner, tendered to Mr. Harold S. Schutt, the former Manager, who has been promoted to a responsible position on the executive staff of the C. H. Geist Company, of Philadelphia. Of course I take it for granted that your readers know the Wilmington gas plant is one of the properties operated by the named Philadelphia corporation. The attendance at the dinner included representatives from the executive manufacturing and new business divisions of the Wilmington Company. Prior to the serving of the dinner Mr. Schutt was presented with a handsome travelling bag by his former men. Mr. A. J. McCorkindale, the newly appointed Manager at Wilmington, who conducted the proceedings, spoke of the pleasure it gave him to voice the sentiment of the men towards their former associate and 'boss,' and assured him that he had no warmer or truer well-wishers for his continued success than those men. Mr. Schutt, in responding, thanked the "boys" for their loyalty to the Company and to himself, and bespoke for his successor that spirit of unity and helpfulness for Mr. McCorkindale that had been so valuable to himself."

THE legion of friends of Mr. John Williamson, Vice-President of the Peoples Gas Light and Coke Company, of Chicago, will be well pleased to know that he is quite recovered from the effects of the accident that so closely threatened his life in an automobile collision, which occurred about mid-March. The industry could ill afford to lose from the active ranks a veteran of the calibre of Mr. Williamson, whose rugged ways are those of one guided by knowledge and controlled by forbearance.

MR. F. R. LISTER, writing from Washington, D. C., forwards the following from a recent issue of the *Times* of that city: "A movement is on foot on the part of certain shareholders of the Washington Gas Light Company to bring a suit in equity under the new Public Utilities law, to oust the present management of the Company, and force the relinquishment of the shares now held by the Washington Company. That such was about to be prepared has been known for some time. Although the Hume suit to name a Receiver for the Georgetown stock was disallowed by Justice Bernard under general equity rules, the Judge declared in his opinion that the Georgetown stock was illegally acquired and held by the Washington Company. But the suit was brought before the new law was enacted. Since then the La Follette amendment has become effective and one of its provisions is that a shareholder of a company may bring suit against any company which unlawfully acquires the securities of another in the same line of business. This provision is believed to supply the legal ground work for a stockholders' suit that was lacking in the prior proceeding. It will be alleged, it is stated, that the Directors of the Washington Company have for a year refused to part with the stock of the Georgetown Company and have forced a condition upon the Georgetown Company that has made it necessary for a part of the people of the District to pay a higher price for gas than the other part."

## The Market for Gas Securities.

The deeps seem to have been reached in respect of the low quotations for Consolidated which opened this morning (Friday) at 132¾ to 133, a virtual gain of 3 points for the week. Furthermore, the tone is decidedly favorable for the long account. There is no particular reason for the "advance," other than that which is incontrovertible that the intrinsic value of the shares is certainly 175.

Brooklyn Union is 127 to 130, and there is absolutely no inquiry for it. Meanwhile the Company's trade is growing by leaps and bounds. The terrible disaster that has plunged the Nation in grief and horror, through the flooding of the West, has had material effec on the gas and electric lighting properties of many cities. At this time it is impossible to state anything in this respect with exactness, except to say that Dayton, Zanesville, Xenia and Fremont plants are out of commission. There is even greater fear of Delaware, O. We have tried to get in communication with Mr. T. Cline Jones, of that city, but without response. Patience and preliminary organization of relief parties, sending the latter as near as possible to the disaster centers are all that can be done now. Meanwhile it is the duty of every man in the industry, in common with every man in all other industries, to be ready instantly to do when the masterful torrents have receded, even in any degree.

## Gas Stocks.

**Quotations by George W. Close, Broker and Dealer in Gas Stocks.**

115 BROADWAY, NEW YORK CITY.

MARCH 31.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

| *N. Y. City Companies.* | *Capital.* | *Par.* | *Bid.* | *Asked* |
|---|---|---|---|---|
| Consolidated Gas Co. | $99,856,500 | 100 | 134⅝ | 133 |
| Central Union Gas Co.—1st 5's, due 1927, J. & J. | 3,500,000 | 1,000 | 108 | 108 |
| Equitable Gas Light Co.—Con. 5's, due 1932, M. & S. | 1,000,000 | 1,000 | 105 | 106 |
| Mutual Gas Co. | 2,500,000 | 100 | 172 | 177 |
| New Amsterdam Gas Co.—1st Con. 5's, due 1948, J. & J. | 11,000,000 | 1,000 | 101 | 102½ |
| New York & Richmond Gas Co. (Staten Island) | 1,500,000 | 100 | 59 | 63 |
| 1st Mtg. Gold Bds. 5 p. ct. | 1,500,000 | — | 98½ | 100½ |
| New York and East River—1st 5's, due 1944, J. & J. | 3,500,000 | 1,000 | 103 | 106 |
| Con. 5's, due 1945, J. & J. | 1,500,000 | — | 96 | 100 |
| Northern Union—1st 5's, due 1927, J. & J. | 1,250,000 | 1,000 | 99½ | 101 |
| Standard | 5,000,000 | 100 | 69 | 70 |
| Preferred | 5,000,000 | 100 | 90 | 100 |
| 1st Mtg. 5's, due 1930, M. & N. | 1,500,000 | 1,000 | 103 | 105 |
| The Brooklyn Union | 15,000,000 | 1,000 | 129½ | 132 |
| 1st Con. 5's, due 1948, M. & N. | 15,000,000 | — | 106¾ | 107 |
| Yonkers | 299,650 | 500 | 180 | — |
| *Out-of-Town Companies.* | | | | |
| Bay State | 50,000,000 | 50 | ⅝ | ⅛ |
| " Income Bonds | 2,000,000 | 1,000 | — | 75 |
| Binghampton Gas Works | 450,000 | 100 | — | — |
| " 1st Mtg. 5's | 509,000 | 1,000 | 97 | 100 |
| Boston United Gas Co.—1st Series S. F. Trust | 7,000,000 | 1,000 | 82 | 85 |
| 2d " " " | 3,000,000 | 1,000 | 47¾ | 50 |
| Buffalo City Gas Co. | 5,500,000 | 100 | 5 | 8 |
| Bonds, 5's | 5,250,000 | 1,000 | 59 | 60 |
| Capital, Sacramento | 500,000 | 50 | — | 35 |
| Bonds (6's) | 150,000 | 1,000 | — | — |
| Chicago Gas Co. Guaranteed Gold Bonds | 7,660,000 | 1,000 | 104 | 106¼ |
| Cincinnati Gas and Electric Co. | 29,500,000 | 100 | 87 | 90 |
| Columbus (O.) Gas Co., 1st Mortgage Bonds | 1,500,000 | 1,000 | 96 | 98 |
| Columbus (O.) Gas Lt. & Heating Co. | 1,682,750 | 100 | 90½ | 91 |
| Preferred | 2,036,500 | 100 | 75½ | 80 |
| Consumers, Toronto | 2,000,000 | 50 | 200 | 204 |
| Consolidated, Baltimore | 13,460,084 | | 118¾ | 119 |
| Mortgages, 5's | 3,400,000 | | — | — |
| General Mortgage 4½ | 10,661,000 | | — | — |
| Con. Gas Co., Baltimore City, 4½ | 2,751,000 | | — | — |
| Consolidated Gas Co. of N. J. | 1,000,000 | 100 | 15 | — |
| Con. Mtg. 5's | 975,000 | 1,000 | 94 | 96 |
| Bonds | 75,000 | — | — | 100 |
| Essex and Hudson Gas Co. | 6,500,000 | — | 133 | 136 |
| Fort Wayne | 2,000,000 | — | — | — |
| " Bonds | 2,000,000 | — | 55 | — |
| Grand Rapids Gas Light Co., 1st Mtg. 5's | 1,350,000 | 1,000 | 100 | 101 |
| Hartford | 750,000 | 25 | 190 | 200 |
| Hudson County Gas Co., of New Jersey | 10,500,000 | — | 130 | 133 |
| " Bonds, 5's | 10,500,000 | — | 104 | 106 |
| Indianapolis | 2,000,000 | — | 38 | 45 |
| " Bonds, 5's | 2,650,000 | — | 104½ | 105 |
| Jackson Gas Co. | 250,000 | 50 | 82 | — |
| " 1st Mtg. 5's | 290,000 | 1,000 | 91 | |
| Kansas City Gas Light Co., of Missouri | 5,000,000 | 100 | — | 86 |
| Bonds, 1st 5's | 3,822,000 | 1,000 | 98½ | 99 |
| Laclede Gas Co., St. Louis. | 10,000,000 | 100 | 99 | 99¾ |
| Preferred | 2,500,000 | 100 | 99 | 102 |
| Bonds | 10,000,000 | 1,000 | 102¾ | 103 |
| Lafayette Gas Co., Ind. | 1,000,000 | 100 | — | 60 |
| Bonds | 1,000,000 | 1,000 | 60 | 65 |
| Louisville | 2,370,000 | 50 | 120 | 120 |
| Madison Gas and Electric Co. | | | | |
| " 1st Mtg. 6's | 400,000 | 1,000 | 106 | |
| Massachusetts Gas Companies, of Boston | 25,000,000 | 100 | 90 | 91 |
| Preferred | 25,000,000 | 100 | 93 | 94¾ |
| Montreal L. H.& P., Canada | 3,000,000 | 100 | 235½ | 236 |
| Nashville Gas Light Co. | 1,000,000 | 100 | 110 | — |
| Newark, N. J., Con. Gas Co. | 6,000,000 | — | 97 | 98 |
| Bonds, 6's | 6,000,000 | — | 127 | 128 |
| New Haven Gas Co. | 5,000,000 | 25 | 182 | 190 |
| Peoples Gas Lt. & Coke Co., Chicago | 25,000,000 | 100 | 110 | 115 |
| 1st Mortgage | 20,100,000 | 1,000 | 103 | 103½ |
| 2d " | 2,500,000 | 1,000 | 104 | — |
| Rochester Gas & Electric Co. | 2,150,000 | 50 | 88 | — |
| Preferred | 2,150,000 | 50 | 118 | — |
| Consolidated 5's | 2,000,000 | — | 104¾ | 105½ |
| Pacific Gas and Electric Co. | 15,500,000 | — | 58½ | 60 |
| St. Joseph Gas Co.—1st Mtg. 5's | 1,000,000 | 1,000 | 96 | 98 |
| St. Paul Gas Light Co. | 2,500,000 | 100 | — | — |
| 1st Mortgages, 6's | 650,000 | 1,000 | 104 | 105 |
| Extension, 6's | 600,000 | 1,000 | 112¾ | 115 |
| General Mortgage, 5's | 3,447,000 | 1,000 | 94 | 96 |
| Syracuse Gas Co., N. Y. | 1,975,000 | 100 | 50 | 55 |
| Bonds | 2,047,000 | 1,000 | 101 | 103 |
| Washington (D. C.) Gas Co. | 1,600,000 | 200 | 427½ | 428 |
| 1st Mortgage, 5's | 600,000 | — | — | — |
| Western Gas Co., Milwaukee | 4,000,000 | — | — | — |
| Wilmington (Del.) Gas Co. | 600,000 | 50 | — | — |

# MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

*American Gas Institute.*—Annual meeting, Richmond, Va., October 15-17, 1913. Officers: President, W. R. Addicks, New York City. Secretary, Geo. G. Ramsdell, 29 West 39th st., N. Y. City.

*Canadian Gas Association.*—Annual meeting Sept. 1913. Officers: President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keillor, Hamilton, Ont.

*Empire State Gas and Electric Association.*—Annual meeting, New York City, Oct. 8, 1913. Officers: President, C. G. M. Thomas, Long Island City, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street, New York City.

*Gas Meters.*—Monthly Section Meetings; Grand Commissioner, I. W. Pefly, New York; Gen'l Sec'y, H. Thurston Owens, La Crosse, Wis.; New York Section, Chairman, Will W. Barnes; Secretary, John M. Brock, 204 Percy street, Flushing, N. Y. Philadelphia Section; Chairman, L. R. Dutton; Secretary, H. F. Patterson, Jr., 833 Chestnut street. Cleveland Section, Chairman, F. R. Hutchinson; Secretary, Wm. Holtz, East Ohio Gas Co. New England Section, Chairman, F. M. Roberts, Haverhill; Sec., F. K. Wells, 69 Broad street, Boston. Winona Section, Winona, Minn., W. F. Clausen, Chairman.

*Guild of Gas Managers of New England.*—Annual meeting, March, 1913. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, Walter G. Africa, Manchester, N. H.; Secretary, H. K. Morrison, Brockton, Mass.

*Illinois Gas Association.*—Annual meeting, March ——————, 1914. Chicago, Ills. Officers: President, W. F. Barrett, Chicago, Ills.; Secretary-Treasurer, Horace H. Clark, 115 No. Oak Park avenue, Oak Park, Ills.

*Illuminating Engineering Society.*—Annual meeting,—————— September, 1913. Meetings of Sections, monthly. Pres., Preston S. Millar; General Secretary, J. D. Israel, 29 W. 39th street, New York City. Sections: New York, Secretary, C. L. Law, 124 West 42d street. New England, Secretary, H. C. Jones, 10 High street, Boston, Mass. Philadelphia, Secretary, L. B. Eichengreen, Broad and Arch streets. Chicago, Secretary, J. B. Jackson, 28 North Market street. Pittsburgh, Secretary, J. C. Mundo, Oliver Building.

*Indiana Gas Association.*—Annual meeting, March 12 and 13, 1914. Terre Haute. Officers: President, A. S. Cooke, Terre Haute; Vice-President, A. C. Blinn, Evansville; Secretary-Treasurer, Philmer Eves, Indianapolis.

*Iowa District Gas Association.*—Annual meeting, May 22, 23, 24, 1913; Burlington, Ia. Officers: President, C. W. Fair, Atlantic, Ia.; Secretary, G. I. Vincent, Des Moines, Ia.

*Kansas Gas, Water and Electric Light Association.*—Annual meeting, October—— 1913. —————— Officers: President, L. O. Ripley, Emporia, Kas.; Secretary and Treasurer, W. H. Fellows, Leavenworth, Kas.

*Michigan Gas Association.*—Annual meeting, September, 17, 18, 19, 1913; —————— Officers: President, W. S. Blauvelt, Detroit, Mich; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

*Missouri Electric Light, Gas, Water Works and Street Railway Association.*—Annual meeting, April, 1913; Mexico, Mo. Officers: President, P. A. Bertrand, Joplin, Mo.; Secretary and Treasurer, P. W. Markham, Brookfield, Mo.

*National Commercial Gas Association.*—Annual meeting and gas show, Dec. 1-6, 1913. Philadelphia, Pa. Officers: President, C. W. Hare, Philadelphia, Pa.; Secretary, Louis Stotz, 29 West 39th street, New York City.

*Natural Gas Association.*—Annual meeting, Cleveland, O., May 20-22, 1913; Officers: President, M. B. Daly, Cleveland, O; Secretary, T. C. Jones, Delaware, O.

*New England Gas Association.*—Annual meeting, February, 18th and 19th, 1914 Boston. Officers: President, T. H. Hintze, Providence, R. I.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

*New Jersey State Gas Association.*—Annual Meeting April —, 1913, ———— N. J.—President, William H. Pettes, Newark, N. J.; Secretary-Treasurer, Arthur H. Osborn Belmar, N. J.

*Ohio Gas Association.*—Annual meeting, February ————, 1913, Columbus, O.; President, John M. Garard, Columbus, O.; Secretary, L. B. Denning, Columbus, O.

*Oklahoma Gas, Electric and Railway Association.*—Annual meeting, Oklahoma City May, ——1913. President, F. W. Caldwell, Shawnee, Okla.; Secretary, H. V. Bozell, Norman, Okla.

*Pacific Coast Gas Association.*—Annual meeting, San Jose, Cal., September 16, 17, 18, 1913. Officers: President, Henry E. Adams, Stockton, Cal.; Secretary-Treasurer, Henry Bostwick, 445 Sutter street, San Francisco, Cal.

*Pennsylvania Gas Association.*—Annual meeting, York, Pa., April 9-11, 1913; Officers, President, H. H. Ganser, Norristown, Pa.; Secretary-Treasurer, W. O. Lamson, Jr., West Chester, Pa.

*Society of Gas Lighting.*—Annual meeting Dec., 11, 1913; monthly meetings, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 29 West 39th street, New York city

*Southern Gas Association.*—Annual meeting, Charlotte, N. C., April 16-20, 1913, Officers: President, C. E. White, Montgomery, Ala.; Secretary-Treasurer, E. D. Brewer, Atlanta, Ga.

*Southwestern Electrical and Gas Association.*—Annual meeting. May 21, 22, 23 and 24, 1913, Galveston, Tex. Officers: President, F. M. Lege, Jr., Galveston, Tex.; Secretary H. S. Cooper, 405 Slaughter Bldg., Dallas, Tex.

*Wisconsin Gas Association.*—Annual meeting, May 14 and 15, 1913, Milwaukee, Wis. Officers: President, I. F. Wortendyke, Janesville, Wis.; Secretary-Treasurer, Henry Harmon, Milwaukee, Wis.